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THE

PROCEEDINGS

AND

MEDICAL COMMUNICATIONS

OF THE

CONNECTICUT MEDICAL SOCIETY.

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MEDICAL COMMUNICATIONS.

ARTICLE I.

"OUR ORGANIZATION."

ITS RELATIONS AND RESPONSIBILITIES.

Being the Annual Address delivered before the Convention, May 27th, 1851.

By the President of the Society,

CHARLES WOODWARD, M.D., OF MIDDLETOWN.

Mr. President and Gentlemen, Members of the Medical Society:

The remarks that I am about to submit to this audience, I trust will possess one quality which you will duly appreciate, that is, brevity. And if I fail to interest and instruct, I hope not to severely tax your patience.

I shall offer a few remarks upon our *Organization*, the distinctive characteristics of its founders, the claims the community has upon it, and endeavor to offer a few suggestions with regard to its future improvement and advancement.

At the time this society was organized, the medical profession in this State was composed of men distinguished for possessing strong minds and practical views; they were close observers, self-made and self-reliant. They were not learned men; they read but little, for the obvious reason, there was but little to read. Few medical books had been imported, and none were written and published in this country for a long time after our revolutionary struggle had ceased; their libraries consisted of a few elementary works among which, and the most relied upon, was Motherby's Dictionary, a very elaborate work giving a description of every thing relating to the science of medicine in all its departments, and being copiously illustrated with plates, it was in fact a library in itself. Nothing can be in stronger contrast than the opportunities enjoyed by the founders of our organization, and the members of the profession at the present day. We are now literally

deluged with medical literature, much of which, we regret to say, is unreliable and not of a practical character. There appears to be a passion for authorship among those who are vain of their scholastic attainments, particularly among the younger members of the profession, who are ambitious to gain reputation, and perhaps inspired with a laudable desire to promote the science, which they would fain believe they are fully capable of doing. They, of all others, are the most inclined to dwell on what is *their* experience and the result of *their* observations, but as they advance in years, they become more and more distrustful of their knowledge, and like the great philosopher, become satisfied that they have only gathered a few pebbles on the beach without having sounded the depths of the sea of knowledge. Perhaps we shall be accused of heterodoxy, when we express the opinion, that there is a disposition to yield to the temptation to read too much. Investigation, we apprehend, will prove the fact that the greatest minds have not been possessed by the greatest readers.

It has been remarked by an eminent writer, F. W. Robison, that he never knew of but one or two fast readers and readers of many books, whose knowledge was worth anything. Mrs. Martineau says of herself, she is the slowest of readers, sometimes only a page in an hour, but then what she reads she makes her own; she further says, there are few girls of eighteen who have not read more than she has. Sir Erskine Perry remarks that Comte, one of the most profound thinkers in Europe, told him he had read an incredibly small number of books, and no reviews, but he further remarks, what Comte read lies fructifying and comes out a living tree, with leaves and fruit. Lord Bacon says there are some books which should be only tasted, others we should swallow down whole, and some choice ones we should masticate and digest. It has been remarked, we think with much truth, that multifarious reading weakens rather than improves the mind, and like the use of tobacco, becomes a habit, a species of dissipation, and unless what we read makes a strong and durable impression at the time, it is useless and unprofitable. It is an undeniable fact that the flood of medical literature with which the profession is deluged, is an evil, and to obtain from it reliable information, is like Roderick searching for a grain of wheat in two bushels of chaff; it is not worth the finding. It is easier to read than to think. In the earlier history of the profession in this State, owing to the sparse population, slow and tedious mode of conveyance, the time required

for physicians to go their professional rounds, allowed them but limited time for reading, but much time for thought, and thrown as they were upon their own mental resources, without the ability to refer to authority, they were governed by reason founded upon observation, which was eminently reliable. Why do we see at the present day, so many entering our profession, men endowed with powerful intellects, brilliant imaginations, prodigious memories, well versed in the classics, the arts and the theory of our profession, but who fail in the practical application of their knowledge? It is because they do not think; they are governed by authority and not by reason. The indisposition to mental effort gives rise to imposition. It is only necessary for some bold pretender to dogmatize with confidence and act with energy, and there will be multitudes of sluggards who are ready to commit their property, their lives and their souls ever, to his control. The medical profession at the time our organization was formed, enjoyed outside the profession a high position. Their counsels were eagerly sought for, and they participated largely in the governmental affairs of the nation.

Politically speaking, they lived in a remarkable period of our country's history; they had for their compeers a set of strong minded, self-taught and self-reliant men,—men who had the moral courage and physical ability to defy the most powerful nation on earth, and successfully carry us through an unequal conflict, and establish a government which has been the wonder and admiration of the world, and which has vouchsafed to us the greatest amount of happiness and prosperity, which any nation was ever permitted to enjoy. Demagogues in politics, and empirics in medicine are of a later growth. Inured to hardship and vigorous exercise, as were those of both sexes, not effeminated by the use of elliptic springs, beds of down, lounges, velvet carpets and still more by the absurdities of fashion, they possessed stalwart forms and gave evidence of physical developments such as we are not permitted to observe among the Anglo-Saxon race of the present day; it was emphatically an age of *mind* and *muscle*. In practice they used but few and simple remedies, but they understood the powers and application of those remedies well. It is said none can wield the cimiter like the Tartar; it is his pastime in youth, and in after life in their national contests it is his main reliance. The indications they attempted to fulfill, were also few and simple, especially in acute diseases; the first inquiry at the bedside of the patient was,

is the type of the disease sthenic or asthenic? Does it require phlogistic or antiphlogistic treatment? If the former, diffusible stimulants, opium and tonics were resorted to. If the latter, the lancet, cathartics, and particularly antimony, were relied upon. Their theory was, bring the patient as near as practicable to the standard of health, and then rely upon the reparative powers of nature to effect a cure. It is perhaps a question whether with the lights of modern science, we have materially improved upon their theory and the practice resulting from it. The instructions they received as pupils and imparted as teachers, were practical and clinical in character. The student, in the latter part of his pupilage, usually kept a horse and rode with his preceptor, which enabled him to witness practice accompanied with its ordinary routine of duties, and on that account had decided advantages over "walking the hospitals." An accurate knowledge of anatomy and physiology they could not obtain;-they had no means of acquiring it; dissections, especially autopsies, were not tolerated by the community, but were looked upon as sacrilege. In 1787, there occurred in New York what was termed the "Doctors' mob." It was ascertained that in the lecture rooms of Drs. Bailey and Post dissections were practised by their pupils. The populace broke into the building and destroyed its contents. Also as late as 1820, at this enlightened period, a similar mob occurred in the Barclay St. Medical College. At this period and under the circumstances, Pathology and Symptomatology were but imperfectly understood; for Louisac had not lived, and the microscope and chemistry had not lent their aid, or shed their flood of light upon this branch of science.

Society has claims upon its individual members, outside of their peculiar callings, especially upon professional men. Clergymen should have a supervision over the morals of community, besides giving instruction through their weekly discourses. The Lawyer should see that by proper enactments provisions are made for the protection of life and property. The Physician's first duty is to restore the diseased to health; it is also his province to see that such sanitary provisions are made as will tend to preserve health. Here is a wide field for usefulness. And to the physician community must mainly look for counsel and direction in all matters pertaining to public hygiene.

Physical Culture should particularly receive the attention of the members of this society, not only because it is immediately connected with the preservation of health, but because, as every

well informed physician knows, there is a close affinity between human mind and human matter; as a general rule, a full development of the former is connected with, or dependent upon, a full development of the latter; we say as a general rule; there are, however, marked exceptions,—we sometimes see feeble attenuated physical systems, like Voltaire, Randolph, Alexander H. Stevens and others, associated with transcendent intellects.

Formerly, great importance was attached to physical training, as having an important connection with the welfare of nations. It is said of the Roman Empire, that with the decay of their athletic games and severe training to which the soldiers and their youth were subjected, fell the empire of the Cæsars. Among the ancients, the state always provided for the physical training of its population. In fact, Plato, Aristotle, Cicero and others, considered a commonwealth defective when athletic games were neglected. The time we hope is not far distant, when the guardians of our youth will attach more importance to the base ball, skating, walking, rowing, calisthenics, and other gymnastic exercises which are partially in vogue, and less to overcramming the intellect.

Our climate is somewhat peculiar, and unquestionably less favorable to physical development, and in its effect, the nervous system, or vital organization, is more active; this, evidently, gives type to our diseases; nervous affections are more prevalent, and statistics go to show that a greater proportion of insanity is found here than in any other portion of the globe.

It is reported that in this country about one in 200 become insane, while in Spain there is not over one case of insanity in 50 hundred of its population.* But not to climate alone, are to be

* *Insanity in Spain.*—Whatever may be the shortcomings of the Spaniard in other respects he is superior to the Yankee, the Briton, and the Gaul, in morals—is not apt to go crazy. Recent statistical tables show that while in London one person in every 200 is insane, and in Paris one in every 222, in Madrid only one in every 2,356 is in this unfortunate condition; and if we take the whole kingdom into account, the disproportion will appear much more striking, since in 1860, Spain with a population of 15,673,451, had but 2,334 lunatics, or one lunatic to every 6,546 new inhabitants. The causes of this general exemption from insanity on the part of the Spaniards, are three: mental lethargy, absence of religious excitement, and temperance. In Spain the church takes care of the souls of the people, there is not energy enough to render speculation in business, philosophy, or ethics, dangerous; and even among the intellectual classes the vice of intemperance is unknown. But setting aside the last mentioned cause, we think that the comparative rarity of insanity in the Iberian Peninsula, may be ascribed to the prevalent stagnation of the Spanish mind.

attributed these changes in our organization. Our practices, habits and customs exert probably much greater influence, and it is this particularly which calls for the interference of the medical profession. We are convinced that the extent of the evil entailed upon us is beyond conception, not only in a sanitary, but also in a social and political point of view, by affecting directly the natural increase of population. The most prominent of these evils is connected with *Female training and education*. We are aware that as far as any thing relating to this subject is concerned, to undertake to combat prevailing public opinion, to advocate sanitary rules founded on true physiological principles, if it contravene *fashion*, would be like trying to regulate or resist the ebb and flow of the ocean's tides. There is evidently going on, in our female seminaries, and generally among the wealthier classes, a struggle between higher civilization and wild nature's vigor. The close observer, we apprehend, will have but little difficulty in deciding which will ultimately prevail.

The physical organization of the female portion of our population is becoming more and more feeble. It is humiliating to be compelled to bear testimony to the truth of what intelligent foreign travelers say of us, when they express their astonishment at the physical appearance of our female population. Hepworth Dixon remarked that "American women were neither flesh nor muscle, but all nerves, and not fit to be wives and mothers."

At our fashionable female seminaries, it is not uncommon for a young lady to have a daily course of ten to twelve studies, from simple arithmetic to the abstract sciences, and all the exercise they get is to walk the streets at stated hours attended by their teachers to see that they *conduct with propriety*. If they would go into the fields and witness the gambols and frolics of the lambs and colts and imitate these, it would do more incidentally for their intellectual development than half the time they spend in crowded and ill-ventilated apartments, cramming, rather than improving their minds. Generally speaking, our female seminaries are nurseries for spinsters, for *they totally unfit their pupils for the marriage relation*—they ignore the views entertained by Dr. Johnson, that a man is much better pleased when he has a good dinner on the table, than when he has a wife who knows Greek. Statistics furnished by the registration of births, show that there are 50 per cent. more births among our foreign population in proportion to their numbers, than among our Anglo-Saxon race. Indeed, fears

are entertained and often expressed, that the Anglo Saxon will in this country eventually disappear to give place to the Teutonic and Celtic. The causes of this are entitled to profound consideration. Why is it that births are so much less frequent now than formerly. Formerly the average number of children was six to eight in a family, now it is less than one-half the number. Dr. Storer of Boston has written an able work, and the Rev. Doctors Todd and Bacon, elaborate essays, to prove that it is owing to the prevalence of a specific vice. We are aware this vice prevails to a lamentable extent, but as for its being sufficient to account for the facts above stated, it is but a drop in the bucket, and the imputation, to a great extent, is an undeserved stigma upon society. In all countries and all ages, certain causes have prevailed which are favorable or unfavorable to human increase. One fact must be considered as established; it is that the number of births is very much greater among the laboring classes, than among those who live in affluence and idleness. In no portion of the globe probably, was human increase so great and so rapid as among the slaves on our southern plantations. Dr. Allen of Lowell, in an able article, quotes the following:

Hippocrates says: "The want of fruitfulness arises from sedentary life, indulgence in riding in carriages, want of exercise, profuseness in living, fatness, and muscular laxness or weakness in the female sex."

Aristotle and Lord Bacon, though not strictly medical men, were remarkable for their knowledge of human nature. Says the former, "The condition most favorable to procreation is a habit of body inured to labor." Says the latter: "Repletion is an enemy to generation."

Dr. Short states that "the poorest and most laborious part of mankind are the fruitfulest," and "the most voluptuous, idle, effeminate and luxurious are the barrenest."

Dr. Buchan says: "Would the rich use the same sort of food and exercise as the better sort of peasants, they would seldom have cause to envy their poor vassals and dependents the blessing of a numerous and healthy offspring. The cause of this comparative barrenness among the wealthy is, affluence begets indolence, which not only vitiates the humors, but induces a relaxation of the solids —a state highly unfavorable to procreation."

Dr. Black says: "High refinement is an obstacle to propagation." Dean Swift remarks with reference to the Irish: "Low diet and moderate exercise are the great restorers of the breed." Alison, the historian, states that "the rate of increase of population is slowest in the most opulent classes." Testimonials similar to these, in great numbers, could be obtained from works on medicine and

history, had we time and room for such references. A great amount of evidence confirmatory of the views here presented, might be gathered from general history, where changes of population with their causes are delineated, also from the history of particular tribes and classes of people, as well as from the genealogical records of individual families through several generations.

This subject should be considered and investigated by the medical profession. If there is a popular error prevailing, on the profession devolves the duty of correcting it. It is a subject worthy of the consideration of the profession whether we should endeavor to have Hygiene, and what may be termed the philosophy of health, taught as a distinct branch in our higher seminaries of learning.

It is with high gratification we learn that one of the noblest members of our noble profession, has recently endowed a lectureship on Hygiene in one of the seminaries in the city of New York, and he himself delivered the first course. I refer to Dr. Willard Parker.

We have now to consider what changes can be made in the plan of our organization, and what changes in our proceedings, to render our meetings more attractive and beneficial. A great deal of thought has been already bestowed on this subject by its members, and various committees have had the subject under consideration, but no changes have been effected. Permit me to urge this subject earnestly upon your consideration; the time has arrived when it is evident that something must be done or we lose caste. The reports carried back by delegates who visit us as representatives from other societies, we regret to learn, are not in all cases very creditable to us. In comparison with other societies, we are considered as behind the age. This is looked upon as an age of progress, but we fail to discover in our organization any change, much less any improvement, since its first formation 70 years ago; but we rather stand as a monument to point out to the traveler what improvements have been made in medical associations elsewhere.

No profession derives so much advantage from the assembling of its members under some form of organization, where knowledge derived from the observation of its members can be received and imparted, as in ours. He who goes his solitary rounds from one scene of distress to another, day after day, without the blessings and relief afforded by one day in seven being appropriated as a day of rest, feels the necessity of the recreation and comfort which

our social and professional meetings alone can furnish. Long continued and constant tension destroys elasticity; this law of forces is as applicable to mind as to matter. From these social gatherings we return to our professional duties with new life and renewed energy.

At the period when our society was organized, the only conveyance the physician could avail himself of, was on horseback; they were necessitated to have their primary organizations by counties, and a state convention made up of delegates from these several county societies. The time and expense these delegates were subjected to, was more than they could well afford, and in order to secure a full attendance it was necessary that their expenses should be defrayed by a debenture to be provided for by a tax on the members. We are now differently situated; steam and machinery have taken the place of bone and muscle; it is easier for those living in the extreme parts of the state, indeed for two-thirds of the members, to meet at our capitals than at our shire towns. It is a subject worthy of your consideration, whether there is in their operation any incompatibility existing between our county and state organizations. Is it practicable to keep up an interest in both? All will agree that our state society should have a preference. The meeting of the members from all parts of the State and members from other States, renders it a broader field, and if all the members were permitted to meet and participate in its proceedings, it would evidently do much more to further the objects for which medical associations are formed. Meet we must and meet we will, and if our county meetings were dispensed with, the inducements would be much greater to attend our State conventions.

Our knowledge of diseases and their appropriate remedies, is derived from the accumulated results of observation. A knowledge of the pathology of a disease, does not of itself lead to the discovery of the remedy, for this is often the result of pure accident. For instance, no improvement has been made, nothing has been added to the discovery which the savage arrived at, though volumes have been written on the pathology of intermittent fever, and the therapeutic action of cinchona,—it all resolves itself at last into the conclusion that the Indian arrived at, which was, that *bark cures fever and ague.*

Ages ago the Arabic Rhazes described the small pox and the pathology of the disease as accurately as it is now described, but

no deduction from this pathological knowledge led to the discovery of its preventive or cure; but a country milk maid living in a district where the disease prevailed, observed that from the udder of a cow a pustule was produced on the hand, which secured immunity from the disease; nor does a knowledge of pathological anatomy furnish any information on the subject to help us in coming to a conclusion; but it all resolves itself in the conclusion which the immortal Jenner, after innumerable experiments, arrived at, namely, that *vaccination prevents small pox.*

Now from what source is our knowledge of the application of remedies to control diseased action derived? It is from the concentrated observations of the individual members of the profession. We are all aware, that one or a limited number of cases establishes no principles which are reliable. It was the relation of solitary cases, which led Dr. Cullen to remark, that there are more false facts than false theories given out to the world. Positive results are what we should aim at, and how these are to be obtained, is a question of great significance. Medical statistics or the adoption of what is termed the *numerical method*, is without doubt the most reliable and the safest guide in adopting modes of treatment.

The first ray of light which science shed upon the healing art (and to this period it was but an art), was through the numerical method. After the aid of sorcery, incantations, necromancy, psalmistry and astrology had been invoked without success, at last a mode was adopted by the Greeks, which established premises on which medicine as a science was founded. It was by having a description of cases as they occurred, written out on parchment, with the treatment adopted, which was deposited in the temples of Æsculapius, and to these temples in the various sections of Greece, the pupils resorted to obtain a knowledge of the art of healing. These collections of facts, imperfect as they were, enabled Hippocrates, Celsus, Aurelius, and other learned men of Greece, to found a system of practical medicine upon scientific principles. Hippocrates more especially, has the credit of being the father of physic as a science. Isolated facts can only be regarded as suggestions which furnish materials for the formation of theories, but conclusions to be reliable should be the result of a multiplication of facts. It is well remarked that there are no absolute certainties out of the pale of mathematics. The senses are fallible instruments, and more or less imperfect. How does the astronomer arrive at his conclusions with regard to the position of an object, or the re-

lation of one object with another? He takes a number of observations with his imperfect instrument, perhaps no two agree, but he takes the mean of all his observations, and adopts it as the nearest approach to the number required. Now let the physician take the same method by bringing together the results of a number of trials of certain remedies in a certain number of cases of diseases. Let these be reported, and from these reports, the most reliable conclusions would be arrived at. If the uncertainty which environs the healing art is to any considerable degree to be overcome, it must be by a resort to mathematical deductions.

The registry of births and deaths in a sanitary point of view, is useful and establishes many important facts, but does not materially advance medical science. For this purpose a registry of cases with the treatment adopted, is required. Every practitioner, especially the younger members of the profession, is inexcusable if he takes no notes and keeps no record of his cases and the treatment adopted in each. The older members of the profession, we feel assured, will unanimously endorse this suggestion. His notes he will find of inestimable value for reference. Then let it be incumbent upon every member, as far as practicable, to present to the convention an abstract of his minutes to be referred to a committee, by them to be used as the parchments in the Grecian temples were used by Hippocrates; the facts adduced to be collected, classified, and spread before the public in our annual publication. We are aware this would impose upon such committee a great amount of labor, but it should be compensated labor. We believe it would be a very beneficial appropriation of our funds.

We cannot, consistently with our convictions of duty, close these desultory remarks, without calling the attention of this society to the claims which our Medical School has upon us. We say our school, for it is our offspring; it commenced its existence under our auspices, and a great deal of responsibility, if it is suffered to languish and decline, rests upon us. For success it must mainly rely upon its teachers, but much can be done by this society, individually and collectively, to sustain the teachers in their efforts. To their fidelity and ability those of us who have had an opportunity to know, will most cheerfully testify. I agree entirely with my predecessors, that the examination of the pupils for graduation give evidence of a high order of instruction. The public, we apprehend, are not sufficiently informed with regard to its merits. Modesty is commendable in itself, but it is not strictly the order

of the day, and perhaps in comparison with other institutions of no greater merit, it suffers from the over exercise of this virtue by its teachers. We should not be sparing in our efforts to sustain them in their endeavors to increase the facilities for instruction, and to advance the standard of medical education.

There is a provision in the law establishing the Medical College, we think unjust; it is at least uncalled for; that is, one student from each county shall be entitled to a course of lectures gratuitously. We are somewhat familiar with the origin of this provision in the charter; if there was ever a necessity for it, that necessity no longer exists. It is an onerous tax upon the professors, and of no benefit to the profession or the community. We would suggest that this convention look into the subject, and decide upon the propriety of its repeal.

At all meetings of the members of medical organizations, the propriety of insisting upon a higher degree of preparatory qualifications of medical students, almost uniformly comes up for discussion. It would do much to elevate the character of the profession, if certain qualfications were required of every student before attending a course of medical lectures. A majority of the subjects which compose a collegiate course, are so foreign to the science of medicine, that a different preparatory course seems desirable; but it should be uniform and the result of the concerted action of the several schools. Many of those who have reached the highest pinnacle of fame in our profession in all countries, have never graduated at any college.

The Rev. H. W. Beecher, whose practical knowledge of human nature is excelled by none, says (in Norwood), "College learning is very much like snow, the more a man has of it, the less the soil produces. It is not till practical life melts it away that the ground yields anything. Men get over it quicker in some kinds of business than in others. The college sticks longest on ministers and schoolmasters, next to lawyers, *not much to doctors*, and none at all to merchants and gentlemen."

It is conceded on all hands that ours is a difficult profession. As a science it is difficult to learn. In its practice we have many difficulties to encounter and obstacles to overcome. Charlatanism, like a hydra-head monster, is ever appearing athwart our course, exerting its baneful influence to destroy confidence in our system. We had occasion to remark that empiricism in medicine was of recent origin. We refer to that which is of a mercenary character.

That which is resorted to, to enable the false pretender to erect his palatial mansions, and sustain a liveried equipage. Credulity has ever been an essential ingredient in the human composition. Mystery has ever had its peculiar charms. It is humiliating to be compelled to acknowledge, that in this enlightened age its hold upon the human intellect is as tenacious as at any former period.

We can readily conceive the difficulty the community has of judging correctly of the abilities and skill of the physician. The lawyer argues for fame, or the reward of victory; he is met by his opposer; we are sufficiently acquainted with the subject matter they are discussing, to be able to judge with a degree of accuracy of their relative abilities and professional knowledge. The Clergyman reasons and argues upon subjects with which he makes us sufficiently familiar to enable us to judge of his learning and reasoning powers.

The physician prescribes; he directs without arguing or being argued with; what he prescribes and why, the attendant or patient is not expected to inquire.

There are many highly educated, talented men who occupy high positions in our legislative halls, on the bench, at the bar and in the sacred desks, who would scoff at the suggestion that witchcraft, spiritualism, Buddhism or Mormonism can be true, but have full faith that a medium can successfully prescribe for a patient a thousand miles distant by examining a lock of his hair; or that a decillionth of a grain or drop of an ordinary medicine will overpower the gravest maladies flesh is heir to. The question now arises, what shall we individually or as an association do in this matter. Shall we endeavor to write or argue down empiricism, with a view of disabusing the public mind on this subject? We say no. Montesquo remarked "that there is in every nation or community, a public opinion on which power itself is founded; whatever shocks that opinion weakens itself, and necessarily loses its influence. Whenever the vanity or interests of rulers tempts them to do acts which are in opposition to public opinion, it always ends in their final discomfiture and downfall." The same may be said of errors in theories and doctrines; they almost invariably die out. Not because they are refuted, but because they are neglected. No system has yet, or ever can, stand the ordeal of public opinion, but the allopathic system as it is called, because it is founded on true physiological and pathological principles. Let its followers observe toward other systems in vogue, a "masterly inactivity" and

they will die of inanition. Dr. Johnson says, "no man was ever written down except by himself." He proved the truth of this noble and excellent rule in his own case, by never replying to the critics who assailed him. The empirical systems in vogue, can never stand the test of trial and investigation; take the systems of Thompson and Hahnemann, they are already in the stage of collapse; neither are followed, although the names are retained; the practice of the followers has become merged in allopathy.

There is a sentiment prevailing among the members of our profession, that as a profession it is not duly appreciated, and for our services we are not properly remunerated. This may be true to a certain extent, but who has the affections of the community about him to a greater extent than the "beloved physician." When stricken down by sickness, whose premises are invaded by more anxious inquirers, or has more earnest prayers put up for his recovery? He is their friend and counsellor in all matters, and in families where he attends, he is identified as one of their members; he is the depository of their secrets; he enters their dwellings unannounced, and leaves it without formality; from this source, to a great extent, he feels remunerated for his anxious toil.

No one should enter the profession under the expection of having a long rent roll, or a large file of certificates of bonds and stocks; if he does he is doomed to disappointment. We should be governed by higher motives and nobler purposes; we should feel that we have entered a field where there is an opportunity of practically carrying out the precepts, and following the example of the "great Physician," and inasmuch as we have lodged the stranger, given food and drink to the famishing, and visited the sick for the work's sake, we have followed his example and served him. For the poor we have with us always. The calls of the sick and needy for the physician's charities are inexorable.

Though gold and silver we have not, if we have been faithful to our calling, may we not hope that we have laid up treasures where moth and rust do not corrupt, and thieves do not break through and steal.

ARTICLE II.

THE RELATION OF THEORY TO PRACTICE.

Being the Annual Dissertation read before the Convention, May 27, 1868.

BY H. A. CARRINGTON M.D., OF NEW HAVEN.

From immemorial time it has been customary in medical schools, to give instruction to the pupils gathering there, in the Theory and Practice of Medicine; furnishing by such honored custom, a sufficient testimony to the value which the profession has placed upon that branch of the curriculum; and a confession to the utility and necessity of a union of the two; and though most of you long since bade adieu to the elementary tuition of the schools, and have been contending with the emergencies of a busy practical life, I hope you will not think it altogether ill-timed, if I invite your attention to some very desultory remarks upon the Relation of Theory to Practice.

To the earnest student of our profession who desires to know not merely what fruits the present age is bearing, but, moved by a laudable curiosity, would seek out and trace back the devious paths by which the past has advanced to the present, rounding out his knowledge into something like completeness, to such an one I think there are very few themes, whether we regard their practical or philosophical bearing, of more interest or that promise a more abundant recompense to the laborer, than the present subject.

The study, in its historical relations only, would furnish one of the most interesting and instructive chapters in the whole history of medicine; and an attempt to develop our subject in any direction, with much regard to completeness, would carry us far beyond all reasonable limits for an occasion like the present; you will understand, therefore, that I only propose to touch here and there upon the periphery of my theme, and with but slight regard to logical order or consecutive thinking.

To speak of theory in any but terms of reprobation, does not fail to excite in the minds of many, a spirit of derision; this is usually the temper of those who pride themselves upon being especially

practical; and who, in their self-judging scorn, despise all attempts to place our science upon a basis of broad or general laws, who, traveling in the narrow round of daily duties, are ignobly content therewith, seem to desire no larger view, and have no sympathy with those who not so contented, are striving to reach an eminence which shall enable them to take a wide and commanding outlook over all these petty details and minute facts, and so be able to range them in a comprehensive order and system. But however ready some may be to sneer, I cannot withhold the avowal of my belief that our profession owes very much to those men who have striven to apprehend the facts of practical medicine and express their real value, and thus give a philosophical or scientific character to what is otherwise but a heterogeneous collection of observation, alike destitute of order or significance. Doubtless, complete success has never yet crowned their labors, and doubtless, also, they have often gone widely astray, and caused others to follow them into the same paths of error, as we shall have occasion to see by and by. But since history does establish this one conclusion at least, that error is a constant, perhaps necessary, result of man's efforts to reach the truth, and that truth is gained after many essays, and through many trials, we must accept all these defeats as so many unavoidable preliminary steps toward the final goal of triumph.

Some are content to call their profession only an art, and profess to expect nothing better for the future; but with such limitations and boundaries I cannot believe that all are willing to rest. I do not ignore the large conjectural element which does, and for a long time to come must, exist in all medical researches, and which while existing forbids us to place medicine among the exact sciences, but there is yet a hope which I am not willing to repress, that the future will witness such a glorious advance in the various branches of our professional knowledge, such increase in the means of diagnosis and such exactness in their use, such extended and reliable knowledge of our therapeutical resources, such perfectness in the physiology of health and its deviations, that medicine shall rank much more nearly with those sciences we call exact, than the performances of its disciples in the past would encourage us to believe possible; and I venture to think that this end will be quite materially served by the theorists, thus entitling them to the very front rank as practical men.

That we may not beat the air in aimless or uncertain discussion, let us seek for clear and definite ideas of our subject, and endeavor to define its limits and terms. The abuse of words has been of old a standing cause for complaint, and we may renew it here, for much of the opprobrium that attaches to the word "theory" comes, I apprehend, from an inexact use or misapplication of terms.

To begin our definition by a negation; the term theory, in strictness, ought not to be applied, as it often is, to the wild and visionary figments of the untamed imagination, the baseless dreams of an ignorant pretender, nor the haphazard guesses of any one. The most lawless expressions of fancy, the wildest speculations, have been judged and classed as of no less value, and of the same rank as the most thoroughly weighed and matured opinions;—opinions based on careful and extended analysis of facts, and a large induction from many instances.

A theory indicates the relation of facts among themselves; it marks their order and succession. A system in medicine is a general theory of the laws and mechanism of life by means of which we endeavor to reduce to a small number of principles, sometimes even to one alone, all the phenomena of health and disease.

Theory, says Claude Bernard, is the scientific idea controlled by experience. *Mere* experience is valueless; and just here is the true difference between the scientific physician and the "old women of either sex;" they bring their remedies that have cured this one and that one of the same disease and "must cure you, so just try it, and never mind what the doctor says;" they bring nothing but a blind unreasoning experience, gathered here and there; an experience, because unreasoning and unenlightened, very much more apt to be false than true. But at the root even of their practice there lies an unconscious theory that the blood needs cleansing, that the stomach is foul, that the liver is sluggish, that the "humors," whatever they may be, are disordered. But just in proportion as experience is reacted upon by enlightened and scientific judgment and the observation of individual facts passed under review, in just such proportion does it become of value not only to the person himself, but through him to others; it is such experience that has contributed to build up the body of scientific knowledge from which the profession is every day drawing supplies.

By a theory then, I understand an orderly arrangement of facts, according to their bearing on some real or hypothetical law; and theories are efficient for good, so far as they are constructed with

such an end in view; and in such a light I can see no just cause for condemning, as many do, theories or those who originated them: on the other hand, I think that some of the finest discoveries of modern medicine, have had their origin in theoretical views.

I had intended, and, had time and opportunity been favorable, should have been glad to have sketched at a moderate length, one or two of the more celebrated theories that have prevailed in medicine, and to have traced out the influence they have exerted for good or evil, over the practical part of our science; but have been obliged to put by such purpose, and must content myself with only a few and somewhat random suggestions of the evils and benefits that may and do grow out of what may be called theoretical medicine, illustrated by very brief references to the past.

And first, as to the evils; doubtless they have been plain and abundant.

We may all have seen or known some man of large acquirements, of no mean intellectual endowments, if not possessing actual genius, who, meditating upon the mysteries of his professional experience, has sought to organize all the facts and explain what of mystery hangs about them, by certain theories; and who having once formed these, could never by any effort of mental vision see any fact that militated against them. It is told of Stephenson, that when some one objected to his rail-road engine, that a cow might get on the track, and what then? the imperturable inventor replied, "it will be so much the worse for the cow." And in their confidence at least these theorists are not unlike Stephenson; if facts get in the way of their theories, so much the worse, they seem to think, for the facts, and they go on as calmly as though the track had been entirely clear. And just here is the great cause of all the evils that arise from theories; that instead of being regarded as provisional and temporary, merely as scaffolding to the edifice of scientific truth, and to be removed when that building shall have been completed, the pride of paternity has been aroused, and they have been sustained against an overwhelming flood of opposing facts, as finalities; and oftentimes by sheer dint of obstinate endorsement have come to pass current as verities beyond question.

The greatest curse that has happened to the medical profession has been its bondage to authority, its willing and ignominious subjection to those who by talent and position, have gained a leadership among their fellows. It is, perhaps, natural enough, but not the less lamentable, that men take up the yoke of servitude so

readily, and surrender their right to see as well as think. Look for instance at the injury such an ascendancy as that Galen obtained, inflicted on the profession. For twelve hundred years he maintained his supremacy almost without a question; nor need we go so far back to find examples: Boerhave, Cullen, Brown and many others have in their turns been the leaders of a sect, and so far successful in imposing bonds upon the minds of their followers. To-day, one of the most hopeful signs for good which we can discover in the medical world is this, that physicians are looking less for leaders, placing less reliance upon the systems of others, and are seeking more narrowly for the truth, questioning nature everywhere to find out what she has to say.

We shall find, in slight review of the systems of John Brown, a full illustration of the evils which may grow out of a theory which seeks to bend every fact to accommodate the theory, or else coolly ignores them; I refer to this system the more willingly, because it seems to be again reviving in a certain modified form. The Brunonian system may be stated in the concise words of its author, to wit:—"Excitement, the effect of the exciting powers, when of the proper degree, constitutes health; when either excessive or deficient, it proves the occasion of disease, or predisposition previous to the formation of disease."—*Elements of Medicine*, p. 111. A very simple and compendious system of medicine, truly! Every form of disease, every disorder of function becomes simply and only a question of more or less; and it was only natural that the system of therapeutics growing up out of such a theory should be quite as simple and compendious, since it is only demanded to increase or diminish insufficient or superabundant excitement, and as we shall see, it is mainly to increase; brandy and not the lancet being his chief ally. His classification of diseases, under the guidance of such a theory is, as one might suppose, unique. Thus, among diseases of direct debility, he classes apoplexy, palsy, plague, malignant fever, confluent small pox, hydrothorax, contagious dysentery, &c.; for these diseases "the indication of cure is to support the excitement. The remedies are powerful stimuli, as electricity, opium, ether, spirituous liquors," &c. The diseases of the sthenic diathesis, are synocha, measles, pleuritis, peripneumonia, mild small pox, dysentery, chicken pox, catarrh, scarlet pyrexia, &c. The causes of disease of both classes, are excessive action of powerful stimuli; as heat, exercise, food, abundance of blood, violent passions of the mind, contagion, &c. The diseases of the sthenic diathesis are to be treated by di-

minishing the excitement, by the employment of slight or defective stimuli, as lying cool in bed, tranquility of mind, bleeding, &c. The diseases of the asthenic diathesis, or direct debility, are intermittent fevers, hysteria, colic, epistaxis, dyspepsia, menorrhea, amenorrhea, scrofula, chorea, gout, dropsy, tetanus, jaundice, &c. The causes here are deficiency of stimuli necessary to the maintenance of good health, or defective stimuli alone. The indication of cure is, to increase the excitement; the remedies are powerful stimuli, such as are exhibited for the cure of indirect debility, only beginning with small doses, increasing gradually.

Thus, as you see, the most opposite and diverse diseases are all to be treated by the same remedies. Doubtless it is a very convenient system which will enable one to treat apoplexy, palsy, phthisis, confluent small pox, hydrothorax, intermittent fever, hysteria, rheumatalgia, epilepsy, scrofula, gout and tetanus all on the same general principles, and that is what the theory of Brown led directly to and culminated in. It is not necessary to spend our time in any refutation of that theory; it is a sufficient refutation to state it. Let me therefore quote once more: "It has been demonstrated," says Brown, "that there are only two forms of diseases; that the deviation from the state of health, in which the morbid state consists, is * * * * not anything that any person has yet (that is anterior to Brown) thought respecting the cause and nature of the morbid state. On the contrary, it has been proved that health and disease are the same state depending on the same cause, that is, excitement, varying only in degree; * * * * and that the whole and sole province of a physician is not to look for the morbid states and remedies which have no existence, but to consider the deviation of excitement from the health standard, in order to remove it by the proper means. "The reasoning part of this doctrine," he adds, "it is expected the reader will find irrepehensible and unanswerable; and the practical parts, from the astonishing cures that have upon innumerable occasions been effected, will ever stand in support of the truth and utility, as well as simplicity of the whole.—*Elements Medicinæ*, p. 169.

The Brunonian system may have been serviceable in directing attention to the fact that many diseases would bear a more stimulating plan of treatment than had been in vogue; but we can hardly explain it, as the modern advocates for stimulation do, by raising up the change of type theory. In those days at least there was no change of type suggested to explain the treat-

ment. Under Brown's theory 97 per cent. of the cases of disease required stimulant treatment, and 3 per cent. only depressing medication. A curious instance of the mutation a theory may undergo, is furnished by the history of this theory in its travels into Italy and France. Rasori divides disease into two classes, excess or want of excitation; but he reversed the proportions, and exalted antiphlogistics and sedatives into the front rank of remedies. In France, substituting irritability for excitement, and christening the dogma as the physiological method, the great means of cure is blood-letting. Broussais did indeed profess to be an opponent of the Brunonian system; but the cardinal idea of his system is that of irritability, and almost every morbid phenomena with him was an indication of inflammation, and inflammation was only a high degree of the irritation or stimulation, which in its proper degree was a necessary condition of life. That the men who practice on any such exclusive theories must be guilty of very much mal-practice, will not require any demonstration here, I presume.

Another illustration of the evils and dangers to which theoretical minds are exposed, which I will simply cite, is furnished in the rise and spread of the homeopathic system; the author of which was very likely at first the dupe of his own fancy, however greatly he may have become the apostle of knavery in later life. The twin dogmas of *similia similibus curantur* and the *dynamization of medicine* by infinitesimal division are fit to stand as full length illustrations of theory run mad.

An allusion to one other class of evils growing out of theories and theoretical terms, is all that I make. Of the many theories that have been broached, to a greater or less extent, they have left their residue in the form of phrases and terms; as for instance, tonics, alteratives, astringents, febrifuges, coction, zymosis, inflammation, &c. Now many times such terms unconsciously influence practice; and we find ourselves prescribing for names of things which never had existence except in the brain of some fantastic genius; but which once emitted and fastened in the language of science, cannot be sloughed off; and the average practitioner who prides himself upon being intensely practical, very much more than he is aware of, uses his remedies according to the classification of theorists, and for conditions expressed by theoretical names, which we have very good reason to believe do not in the slightest degree describe the actual state.

To pass from these generalities, let us illustrate the application of theory to the practice of medicine by one or two instances.

The first that comes to hand is that universal scourge of the race, Phthisis; and I take this because the symptoms are clear and well defined; because the disease is so universal and has existed from the earliest period of recorded medicine, and therefore every one may have observed its course, speculated on its cause, and had abundant opportunities to test his therapeutical resources on its unfortunate victims; so that one might suppose that if any uniformity of view or similarity of treatment were possible to attain in this disease at least, there should have been little or no room for doubt or mistake. We find, however, on a review of the theories of cause and methods of cure, the latter has varied as one or the other of the former have prevailed. In certain respects the descriptions Hippocrates gave of the symptoms and course of the disease, stand to-day unrivaled for clearness and precision; and in some respects, too, his prescriptions are similar to those that the highest medical wisdom of to-day enforces; but between him and the present there has been every variety of opinion of the cause, nature and treatment. Hippocrates affirmed that the expectoration in phthisis arose from ulcerations of the lungs, and in his theory he seems to have regarded it as only a local disease. His treatment was mainly dietetic and hygienic; making free use of milk—mares, asses, goats or cows; meat, fat fish, and other fats, walking exercise for many miles daily, and the avoidance of atmospheric or thermal changes; but, less rational, he also advises caustics, emetics and purgatives.

These and similar views prevailed for many centuries, and little was added to the actual knowledge of the disease. The modern methods have been legion. Some have bled, others forbidden the lancet with the utmost strictness; some have given emetics; some, tonics; some, digitalis; some, iron; some, milk; some, tar water; some, oxygen gas; others have held that there was too much oxygen in the system already, and that carbonic acid was the proper thing to take; some have recommended blisters, caustics, and even the actual cautery, imagining, doubtless, that such a severe disease needed heroic measures of cure; some have sent their patients on sea voyages; some have sent them to bed with the cows; now a mild climate, and now a cold one must be tried, and myriads of tombstones proclaim alike the futility of one and the other; some have found in whisky the great specific; and who has not given cod liver oil? Now it is necessary to supply the phosphates if we would see our patients restored to health; at one time the fashion

is chlorine, then iodine, and again sulphur; but I might go on almost ad infinitum to rehearse means and methods that have been adopted according to the prevailing theory; according as the disease has been regarded as local or constitutional; as due to particular or general causes; to debility or inflammation; as hereditary or spontaneous; as owing to climate or civilization; as caused by hæmoptysis, or the reverse; but the summary already given will doubtless be enough for your patience as it is for my purpose. The last new theory of the zymotic nature of Phthisis has not as yet made any excursions into the practical, and I believe it yet remains without a therapeutical application, though we may easily see how important it will be, in that direction, *if true*. In the history of this disease and its treatment, we find plain and abundant proof of the fact that, as narrow or erroneous theoretical views have prevailed, the therapeutical means have been inadequate or injurious; and as the profession has come to understand better its nature, and approximate its theories to the truth, the disease has been less, and therefore more correctly treated. And the great aim has been more to obviate the causes and to supplant the tendency to death, by restoring as far as possible the proper hygienic condition.

Fever, another of the common diseases, will furnish us with one more illustration of our theme. I speak of fever in the generic sense, without regard to the distinctions of our modern schools into various species, for the principle I seek to illustrate is not affected by the recent classification.

And here again we must remark at the outset, how the sagacity and genius of Hippocrates anticipated not only modern theories but modern discoveries; for his theory of coction and crisis anticipated, if it did not originate, the zymotic notion and the self-limitation of diseases. Without pausing to enumerate theories or methods of cure, I may briefly sum them all up in a few words. According to the belief which has prevailed, whether the disease was an effort of the system to throw off a morbid poison, and one in which art could not accomplish more than to sustain the system during this contest; or whether it has been held that the offending substance could and should be sought out and expelled from the body, taking the entire business out of the hands of nature as completely as the other school trusted it to her;—according to one or the other of these modes of thinking and reasoning have physicians acted; hoping on the one hand to extinguish the morbid agent by their activity in emptying the blood vessels, or the bowels, or to

drive it out by the pores of the skin; by depressing the exalted activity of the bodily functions in every possible way, by starvation, by depressants as digitalis, antimony, emetics and purgatives, striving by all the resources of art to exorcise the offending substance;—or, on the other hand, seeing how poor a chance the patient stood for recovery from this vigorous and energetic pursuit of the disease; others have thought the patient should be supported and sustained, and accordingly they have given him a staff in the shape of stimulants to lean on until the materies morbi should be expelled by the efforts of nature contending lustily against the intruder; a staff of which, by the way, we may say, that it sometimes seems more of a *food* than a support;—and finally, others, remembering the fable of the famous shield, have thought that somewhere between these contending hosts the truth was more likely to be found, have deemed it best rather to watch the course of the disease, and acting upon no absolute theory, have not given him alcohol upon suspicion that he might need it, nor depleted him because he might be too much excited by and by; but have interfered only to alleviate his hours of distress, and act as it were as a mediator, rendering aid only as demanded by existing emergencies, and not seeking to forestall a condition that might never appear.

And thus we are led to repeat the remark already made, when speaking of Phthisis, that as theories have been improved and have come to be more in conformity with the nature of the disease, treatment has been less violent and disturbing, confidence in curative measures lessened, and increased confidence in the observance of hygienic conditions. You may say to me, that I am substituting results for causes. I am not, however, unmindful of the difficulty in medical inquiries of separating and defining the limits of one or the other; but yet, after a somewhat extended review of the literature of the subject, I am satisfied that correct theories do bear an appreciable and beneficial relation to practical medicine, and that much bad practice is due to false reasoning and incorrect theories.

We are apt to imagine that the theories of this present age are new, and our methods original; but as one passes in review the history of what others have thought and done even in the far distant past, this conceit will disappear, and Solomon's assertion that there is nothing new under the sun will come home with increased force and power. Almost if not quite every vagary of modern

times has its anecdotal vagary in the past. The blood-letting controversy which has raged with such vehemence in some quarters, began back in a remote antiquity, though it was not till recently that men learned to invent the change-of-type theory; that I believe is modern.

In conclusion, it remains for us only to endeavor to define the true sphere of theory, and attempt an estimate of the benefits that may be expected to flow from a proper use of the same.

Says Locke: "Hypotheses, if they are well made, are at least great helps to memory, and often direct us to new discoveries. But we should not take them up too hastily (which the mind that would always penetrate into the causes of things, and have principles to rest on, is very apt to do) till we have very well examined particulars, and made several experiments in that thing which we would explain by our hypothesis, and see whether it will agree with them all; whether our principles will carry us quite through, and not be as inconsistent with one phenomena of nature as they seem to accommodate and explain another; and, at least, that we take care that the name of principles deceive us not, nor impose on us, by making us receive that for an unquestionable truth which is really at best but a very doubtful conjecture."—*Lewes' History of Philosophy, Vol. I, p. 243.*

These words form an epitome of the whole subject; and little more remains for me than simply to reiterate the points he has already made. I claim, in the first place, that to form a theory of any phenomena is the first step to obtaining a true practical knowledge of the phenomena. One may observe certain facts many times; but he gives himself no concern about them any more than the dumb cattle that see but inquire not, and consequently he learns nothing; experience is of no value to him, repetition does not serve any good purpose; for he knows nothing more for an hundred opportunities than for one,—the ninety and nine teach him nothing that the first one did not. The nations have not obtained a knowledge of astronomy by simply looking up to the stars; to make progress in such a science it is necessary to add reason to observation. It is because theory, in a just appreciation of it, demands the exercise of the reason,—demands comparative observation,—demands that we either institute experiments ourselves, or carefully watch those which nature performs for us,—demands that we look before and behind and on either hand, taking up with careful scrutiny the individual facts not less than the classes;—it is because to theo-

rize correctly and truthfully requires such things, that I would seek to defend it from unmerited reproach. The practical man must ignore all this, and hence it is that experience is worth so little to many men; facts lie in their minds like pebbles upon the shore of the ocean, without order or relation. For an example of one who has pursued theoretical inquiries in a spirit such as I have indicated, I refer to Claude Bernard, whose brilliant discoveries in experimental physiology and pathology have been made in obedience to such principles, and whose motto is, to use his own words, "When we encounter a fact in opposition to a reigning theory, it is our duty to accept the fact and abandon the theory, even though it may be sustained by great names, and generally adopted."*

I am not unmindful of the truth that many of the most valuable discoveries in medical knowledge have been apparently accidental; but this is measurably true of every science, and does not shake the position I have taken, for, after all, every such discovery will, I apprehend, be found to owe its adoption mainly to the more theoretical minds of the profession. The practical men have, for the most part, scouted every such invention or discovery, whether it was mercury, antimony, vaccination or ether. The greatest single discovery of modern medical science, that of anesthesia, was the result of a theory.

Theories mark or test the amount of our knowledge in relation to things about which we theorize. The theories of Faraday or Liebig are superior to those of Paracelsus or Van Helmont; Newton's suggestions to those of Copernicus; but the proposition hardly needs proof.

Theories stimulate inquiry to sustain or rebut the positions taken, thus being instrumental in separating the known from the unknown, and in giving definiteness and precision to our information. In physiology, for instance, how many facts have been discovered by men who had a theory to establish or overthrow. The discovery of the circulation of the blood, even, was the result of a theory. "I began to think," says Harvey, "whether there might not be a motion, as it were, in a circle."—*Works, Syd. Soc. Ed., p.* 46. Columbus pursued a theory till it resulted in the revealing a new

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*"Quand le fait qu'on rencontre est en opposition avec une théorie régnante, il faut accepter le fait et abandonner la théorie, lors même que celle-ci soutenue par de grands noms, est généralement adoptée.—*Introduct. à l'étude de la Méd. Experimentale, p. 282.

world. Without a theory Newton would not have unfolded the grand laws that bind the universe to harmonious action.

That in practical medicine the application of theories to the cure, relief, or prevention of disease, has undoubtedly been productive of much harm, I am willing to confess. But how few of us, nevertheless, do not practice upon some theory? often, perhaps, all unconsciously, but none the less really. It does not follow that because practice is based upon theory that it must be wrong or harmful, even though the theory itself be erroneous. It is said of Boerhave, that in following out his fanciful notions, he stumbled upon some practices, the utility of which has been sanctioned by experience. For example, he dissuaded from the use of sudorifics and strong purgatives in pleurisy, from the consideration of their carrying off the most liquid part of the blood, leaving the remainder in that state of spissitude, in which he thought the proximate cause of inflammation to consist. He believed that the blood owed its red color to iron, and in that view strongly recommends iron in chlorosis and other diseases of chronic debility, in which there is a general deficiency of the red globules. These, and many other instances that might be cited, prove that one may reason erroneously, or theorize incorrectly, and yet practice very rationally.

We can hardly say as much for another theory, which I quote from Zimmermann. A Dr. Short relates the wonderful history of a man who became consumptive, and who had his body covered with ulcers. This patient, he says, was perfectly cured by means of the elixir vitriol, and the use of the cold bath. Short was desirous of seeking the cause of this cure in the increased pressure of the air; and after, as he thought, having established his hypothesis, goes on to propose a cure of hydrophobia from analogy; and this he would do, he tells us, by letting the patient down into the sea to the depth of ten feet; because then he supposes the weight and pressure of the water will be sufficient, by bracing up the solids, to promote and increase the urinary discharge and perspiration, and thus carry off the poison. The historian does not inform us whether the ingenious Doctor ever put his theory to the test or not; it certainly is very plain that it would be an *effectual* remedy.

But to conclude, for I must not tax your patience further, what is the final estimate we put upon theory in its relation to practice? Neither excessive laudation nor excessive depreciation, but this,—that with due regard to proper limitations and conditions, a theory is a very valuable servant to the cause of truth. If we receive it as

a provisional statement or explanation, the truth of which remains to be established, either by experiment expressly instituted, or by taking advantage of those that are being made for us by nature, then it is to be welcomed;—if, on the other hand, we are to take the theory of this or that man as the ultimate expression, and become partisans instead of seekers, in that case it brings only a train of evils. While so much remains to be known, while the measure of our positive knowledge is so small compared with what remains to be known, the field for speculation is practically unlimited; and I look for much aid to be rendered in that direction by shrewd and well-digested theoretic suggestions.

As we said in the outset, so we say in conclusion, that one of the most encouraging signs of promise in the medical world is this, that schools and systems, theories and hypotheses, find so few heated, bigoted partisans; and that the profession, as a whole, stands so far above the narrowness of sectarianism.

ARTICLE III.

ARMY HYGIENE.

JEWETT PRIZE ESSAY,

ON THE QUESTION,

BY WHAT HYGIENIC MEANS MAY THE HEALTH OF ARMIES BE BEST PRESERVED?

Haec autem cognosci experimentis.—*A. Cors. Celsi Liber Primus.*

BY

ROBERTS BARTHOLOW, A. M., M. D.,

PROFESSOR OF MATERIA MEDICA AND THERAPEUTICS IN THE MEDICAL COLLEGE OF OHIO; FORMERLY ASST. SURGEON (CAPTAIN) U. S. ARMY, ETC.

PRELIMINARY.

To attain the utmost exemption from the diseases incident to military service, as well as the highest degree of physical efficiency, care must be used in selecting the men composing the army. But the wisest discretion in selecting men will avail little if no attention be given to the hygienical management of the recruits after their entrance upon the military life. The process of transforming a civilian into a soldier, is attended with various dangers to his health, which may be lessened or prevented. If the recruit pass unharmed through this transitional period, he encounters as a soldier, sanitary evils in other shapes.

The hygienic means by which the health of armies may be best preserved, can, therefore, be advantageously studied in respect to the SELECTION OF RECRUITS, the TRAINING OF RECRUITS, and the EXPERIENCES OF THE SOLDIER.

CHAPTER I.

THE SELECTION OF RECRUITS.

The discussion of this subject in its entirety would embrace the whole field of military medical jurisprudence, but such an extended treatment of the questions involved, is, obviously, not within the scope of the proposed inquiry. It is necessary, however, to attach due importance to those conditions which do not come within the cognizance of the examining surgeon, or are so ill-defined as not to constitute valid causes of rejection under recruiting regulations.

Capacity for military service consists chiefly, in the possession of accurately adjusted physical powers; but it includes also, certain moral and intellectual qualities comprised in the term *aptitude*. The most military nations, have exhibited great solicitude in respect to the physical qualities of their soldiers; but this solicitude has not always been expended in the right direction. The demands of great wars have too frequently, lowered the standard of requirement unduly. Even in time of peace, sufficient attention is not given to all those conditions of the human organism, as age, constitutional peculiarities, morbid tendencies, which favor the reception and growth of morbific agents and insure the development of inherent vices. In any scheme for preserving the health of armies, the judicious selection of recruits should hold the first place.

As a basis for the inquiry, it will be useful to ascertain what has been the practice of the most military nations, and how far it has conformed to the requirements of hygiene.

The Romans, the most warlike nation that has ever existed, admitted the justice and necessity of certain causes of exemption from military service. When the exigencies of the state required —as an insurrection in Italy—all citizens from the ages of 17 to 45 were compelled to enlist, and sometimes the sick and infirm (*consenti*, *T. Liv.* VI. 6); but physical disability was generally held a sufficient excuse. The careful training to which recruits were subjected and the length of the tenure of service, were well calculated to produce a military organization of high efficiency—for the weak and infirm must have soon yielded either to the preliminary training or to the hardships and exposure of the numerous campaigns upon which the Roman soldiery were engaged. Twenty campaigns was the term of service of a foot soldier, and ten of a cavalryman. Early in the history of the city, no one could hold an office who had

not served ten campaigns (*Polyb.* VI. 17). The immense losses which must have occurred from the failure of recruits, probably, rendered this prolonged service necessary—for a man having survived all of the accidents of his first campaigns, was not to be given back to civic occupations in exchange for an untried civilian.

In France, the most military of modern nations, the conscription includes, with a few exceptions, all above 20 years of age. The standard height is 5 feet 1¼ inches. Provision is made for ascertaining the existence of constitutional vices although they may not have resulted in specific physical disabilities which unfit for military service. The "Councils of Revision" are required to determine whether "by reason of feebleness, morbid tendencies or existing disease, the health or life of the recruit may not be compromised by the ordinary circumstances of the military career."—(*Dictionnaire Code des Officiers de Santé etc. Deuxième Part*, p. 461.)

The age of 18, except in the case of musicians, is the minimum age for admission to the British army. Voluntary enlistment being the mode of recruiting the army, the usual inspection of all who apply, is made by the recruiting and medical officers. Those are not accepted who do not conform in age and physical stamina to the official requirements, but constitutional states, unless evidenced by existing disease which unfits for service, and morbid tendencies, are not recognized as valid causes of rejection.

In Prussia, military service is required of all men not physically disqualified, between the ages of 20 and 30. The forces are divided into four classes: The standing army which consists of all able-bodied men of twenty; the "landwehr of the first ban," which is made up of the men from twenty to thirty-two, who do not belong to the standing army; the "landwehr of the second ban," composed of the men from thirty-two to forty years of age; and the "landsturm," which includes all from seventeen to fifty not embraced in the three other classes. The landwehr of the first ban, constitutes an army of reserve to be called out in case of war. The landwehr of the second ban, in time of war garrisons the fortifications and may in emergencies be required to fill up the regular or standing army. The fourth class is called out, only, in the case of invasion. So thoroughly does the Prussian military system embrace all, that those disabled in service, and invalids unfitted for field service, are organized into an Invalid Corps. During the recent military operations, which culminated in the battle of Sadowa, the Royal Prussian Army was composed of the standing army and the landwehr of the first ban, the flower of the population.

Nineteen is the minimum age for admission to the Austrian service, and the duration of enlistment is eight years under the colors and two years in the reserve.

There are two principal sources of supply to the Russian Army: conscription from the class of peasants, and those born into the military service—the sons of soldiers. Twenty-five years is the period of service for the line, twenty-two for the guard, and twenty for military colonists. So great length of service insures the elimination of the weak and infirm, but as the conscripts are selected by lot, there must be a large number admitted, who are disqualified by reason of constitutional vices. As a general rule, however, the Russian soldier has the physical qualities to fit him for a military life.

In the United States' service, eighteen is the minimum and thirty-five the maximum age at which recruits are admitted. During the rebellion, under the Enrollment Act, the age of twenty was fixed as the minimum and forty-five the maximum. As in the English service, only obvious physical defects constitute a valid cause of rejection and the influence of diatheses and cachexias is practically ignored.

I have now to inquire whether the practice of governments has been judicious in the hygienic sense, in fixing so young a minimum age, and in ignoring to so great an extent, the influence of constitutional states in the production of army diseases. After a careful survey of the whole ground, I venture to affirm that a due regard to the hygienic condition of armies, requires that the minimum age be elevated to twenty five, and that the influence of diatheses and cachexias in the causation of disease be suitably recognized.

This declaration cannot be admitted without proof.

The facts of anatomy and physiology conclusively demonstrate that the growth of the body is not completed until about the 25th, and according to some authorities, not until about the 30th year. Thus M. Quetelet (*Tardieu, Dictionnaire d'Hygiène Publique, etc. Tome 3me, p. 2*) asserts that the growth of man is not completed until thirty; his figures, however, show that but slight increase takes place after twenty-five. Quain, in his great work on Anatomy, has demonstrated that the epiphyses of the radius, ulna, femur, tibia and fibula, are not permanently united to the shafts of these bones until the twenty-fifth year. The same fact is insisted upon by Aitken (*Growth of the Recruit and Young Soldier*, 1862, p. 37). As the development of the muscles proceeds *pari passu* with the

growth of the bones, it is certainly true that these important parts are not matured until the union of the epiphyses with the shafts of the long bones has taken place. The hardships and exposure of the military life interrupt the normal development of the bones and muscles. Flattening of the chest and gibbosity are produced by carrying the knapsack and other accoutrements. The most important changes are those produced in the lungs and heart. It is a well known fact that hypertrophy of the left side of the heart and dilatation of the right cavities, occur as a result of unwonted exertion in a frame not yet matured, and possibly weakened by insufficient and improper food. This fact is signalized by Hammond in his able treatise on hygiene (*sec. 1, chap. 1*). He also refers to the flattening of the chest and "the consequent development of the tubercular disease of the lungs," as a result of the operation of the same causes (p. 39.) Some very striking observations on the same subject, have been made by Dr. W. C. Maclean, Professor of Military Medicine in the Army Medical School.—(*Parke's Manual of Hygiene, 2d edition*, p. 397.) "From the 1st of July 1861 to 30th of June 1862, 4081 men were discharged the service; 569 of them (or 13·92 per cent.) had less than two years' service, and of these 14·76 per cent. were lost to the service by *heart diseases*."

"From the date of my assuming charge of the medical division at Fort Pitt in April 1861 to the end of last year, no less than 333 cases of diseases of the circulatory system have passed under my observation, and been lost to the service, and this from one class of diseases; the great bulk of the cases being *young men*." In another place, Dr. Maclean remarks, "a vast number of the young soldiers discharged the service for heart disease, have never suffered from rheumatism at all." These statistics confirm the deductions of physiology and the practical demonstrations of the anatomist. The heart, in common with the rest of the muscular system, does not attain its full development until about the age of twenty-five, and is very liable to be damaged by excessive work previously to that age.

Moreover, recruits under twenty-five are more susceptible to the action of the common causes, and to some of the specific causes of disease, than men more advanced in life. Thus, the sickness rate amongst the young conscripts in the French army, is one-third greater than in the army generally. Whilst the mortality for all ages was in 1863, 9·16 per 1,000 of mean strength, amongst the young conscripts it was 13·26 per 1,000. This fact was exhibited on a large scale during the war of the rebellion; a great many young

men were admitted to the ranks; they were found in large numbers in the various military hospitals, affected with measles, pulmonary and intestinal diseases, fevers, and the results of cardiac lesions. I may cite in illustration of these observations, the statistics of camp measles. According to Circular No. 6, "21,870 cases and 551 deaths were reported during the first year of the war, 16,345 cases and 1,318 deaths during the second; but there is reason to believe that the actual number of cases was considerably greater, since it is well known that the disease frequently prevailed epidemically in new regiments after the men began to come together in the State to which they belonged * * * * before their medical officers began to report to the Surgeon General's Office." That this disease prevailed chiefly amongst young recruits, appears conclusively from some statistics published by Asst. Surgeon Roberts Bartholow in the *American Medical Times* for May 14, 1864. "In 100 cases only four were old soldiers, in two of whom it is probable the disease occurred a second time; in 28 cases of the 100, the recruits were aged 18; and in 68 cases the ages of the recruits were from 17 to 20 inclusive." He further states that "the mortality in the 100 cases analyzed was 28, but the average mortality for the hospital was 22·4 per 100 cases."

Said Napoleon on a memorable occasion, "I demand a levy of 300,000 men; but I must have grown men; boys serve only to encumber the roadside and to fill the hospitals." This great captain, saw that young recruits were deficient in the hardihood and physical endurance necessary for the soldier, and that they were also more liable to disease than older men. The leading military authorities are unanimous on this point. Ballingall (*Outlines of Military Surgery*, 5th ed. p. 33) says, "I think we may state that the most eligible period of life for enlistment is from twenty to twenty-five years of age. These views are all too forcibly illustrated and too fatally confirmed by recent events in the Crimea, and from the sentiments expressed by distinguished statesmen in both houses of Parliament, it is to be hoped that an end will now be put to the practice of sending youths abroad, not to live, but to die, at the public expense." Dr. Macleod (*Notes on the Surgery of the War in the Crimea, p. 97, Eng. ed.*), in some remarks upon the character of the recruits sent out to the Crimea, presents in the most forcible manner the evils of enlisting youths. "Many of them were raw boys, ill-conditioned, below the standard age, and undeveloped in body, unconfirmed in constitution, and

hence without stamina or powers of endurance. * * * * Cholera or fever speedily seized them, overtaxed as they were in work, and unaccustomed to either the food or the exposure which fell to them. The hospitals became filled with such unpromising patients, whose 'winsted' look of premature age was remarked by the most casual observer. If these unfortunate boys were severely wounded, they almost invariably died," etc. Tardieu (*Dict. D'Hygiene*, *op. cit.*, *Tome* III, p. 2), after an examination of the relative mortality at different periods of service, remarks upon the impropriety of enlisting youths, as follows: "It is not alone necessary that recruits should be vigorous and well made, but they should have arrived at an age when they have acquired all their strength. * * * We may cite a remarkable example of the importance of age to soldiers—the campaign of 1805, in which the army marched 400 leagues to reach the battle field of Austerlitz, leaving very few sick upon the road. The youngest soldiers were then twenty-two years of age and had been two years in service. In the campaign of 1809, the army encamped in the German provinces, had but a short distance to march, yet all the hospitals were filled with the sick. More than half were under twenty years of age."

The military experiences thus strongly support the teachings of hygiene—that men are not fitted to endure the fatigues and privations of a military life, until the growth is completed, the epiphyses are united to the shaft of the long bones and the muscles are fully developed.

Besides the physical evils which grow out of the enlistment of very young men, there are certain moral considerations which should not be overlooked. As the philosophical Jackson has stated, (*Economy, Formation and Discipline of Armies*, p. 12), "In youth action is rapid, impetuous and desultory, but it is not steady and persevering; desires are fierce but they are changeable," "In mature age, action is vigorous, steady, and persevering. * * * Hence, persons who have attained mature age are the persons to constitute that part of the army which is destined to decide the battle by constancy of courage and the grasp of power." Hammond has expressed similar ideas in a more practical form. "Whilst success attends the course of an army, the soldiers under adult age are not prone to be depressed and discouraged; on the contrary, they are often excessively enthusiastic; but as soon as reverses ensue, or the food or clothing get to be deficient, or the weather changes for the worse, melancholy and nostalgia attack them, and they be-

come at once worse than useless." All physicians are aware of the influence of the depressing emotions in the causation and exacerbations of diseases. Nostalgia not only proves fatal of itself, but it is an element of no small importance in determining the mortality from various diseases of the camp. It need hardly be asserted that nostalgia, although not confined to very young recruits, is nevertheless much more common amongst them.

Old age does not so frequently come in question as influencing the hygiene of armies, as youth. Nevertheless, some observations on this point may not be entirely useless. After forty-five, the maximum age at which recruits should be admitted, various defects become manifest, of which changes in the circulatory system, fatty and calcareous degeneration of organs, fragility of bones, flabbiness of muscles, loss of teeth, impairment of nutrition in consequence of changes in the glandular apparatus of the intestinal canal, and diminished activity of the special senses are most important. Premature old age, in which the changes above sketched occur at an earlier period, indicates a vice of constitution fatal to military efficiency. The indications of age should, therefore, govern the decision in any case, rather than the number of years of life as shown by the baptismal register.

There are certain diathesis and cachexias which play an important rôle in the hygiene of armies. They should have their true importance assigned them in a discussion of this subject—for they are the obscure causes of many of the most serious diseases of the camp. It is not always possible to recognize the existence of these constitutional states, and if recognized, the propriety of rejecting men on account of them may not be conclusive. Furthermore, the necessities of States may be so urgent as to forbid too rigid application of the rules of hygiene. As the strength of an army is measured by the number present and fit for duty, and not by the number of names borne on the muster rolls, there can be no real advantage in enrolling those who will quickly fall a prey to disease. Viewing the question solely from its hygienic aspect, there can be no doubt of the propriety of a rigid scrutiny into the constitutional predispositions of recruits, rejecting, as unfit to bear the hardships of a military life, those affected with the rheumatismal, the scrofulous, the tuberculous and the albuminoid diathesis; and the scrofulous, the tuberculous, the syphilitic, the alcoholic, the paludal, the saturnine and the mercurial cachexias. The constitutional states implied under these terms, are as distinct clinically,

as the terms themselves, are distinct etymologically.—(*Des Diathèses et Des Cachexies, par Dr. Tim. Pilz, Strasbourg, 1865.*)

The relation of constitutional states to local diseases, is a *vexata quæstio*, which cannot be answered in the present state of medical science. Nevertheless there are sufficient data to justify the assertion, that if the diathesis or cachexia exist, the rough experiences of the soldier can hardly fail to rouse it into activity. This is especially the case with the rheumatismal, the tubercular and the albuminoid diatheses and with all the well-marked cachexias. In addition to the immediate effects of these constitutional states, the subjects of them are especially liable to intercurrent diseases of a grave character. The influence of the constitutional diseases in the sickness rates of armies is exhibited on a large scale in the statistical report for the first two years of the rebellion. For the first year, the number of cases returned under the head of *constitutional diseases*, was 52,474, and for the second year 117,738. The number of discharges for this class of affections for the first year was 7,298. Making a suitable allowance for feigning and fraud, there remains a large number of these cases, showing unmistakably the influence of the diatheses and cachexias upon the hygiene of the army, and the necessity for eliminating them in the selection of recruits. It may be enquired—What is the practical value of this recommendation? How can the elimination of the diatheses and cachexias be accomplished? Many of them are evinced by such characteristic signs, and have so affected the health and stamina as to authorize rejections under recruiting regulations. But I now refer more especially to those constitutional states, which, although evident in the physical characteristics of the individual, are yet more conclusively shown in the family history. Hence hereditary predisposition—the appearance in successive generations, of scrofula, tubercle, rheumatism, the albuminoid degeneration of organs—should be made a leading idea in the investigation of the fitness of a man for the military service, just as it is made a question of importance in the examination for life insurance.

The ideal standard of a good recruit, may be stated as follows: height 5 feet 10 inches; weight 160 pounds; thorax, 36 inches in circumference. As tall stature is usually gained at the expense of the thorax, and is derived from the length of the legs, very tall men are not only deficient in power, but are exposed to various diseases in consequence of their height; e. g. pulmonary affections, camp dysentery, and various. Below the minimum standard, power is deficient, and sources of decay exist in the original weak-

ness of the formative or developmental force. Obesity is a condition significant of grave lesions of the nutritive processes. Much depends upon the vital capacity, the expansive mobility and the development of the chest. In general, it may be stated as a close approximation to the ideal standard, that the girth of the chest should equal half the height, and the expansive mobility be not less than three inches. A less capacity than this, indicates disease, or a tendency thereto, which may develop into serious mischief under the trying conditions of a soldier's life.

In order to secure a healthy state of an army, it is not alone necessary to enlist men who conform, more or less closely, to the ideal standard of physical manhood. Those moral and intellectual qualities comprehended under the term aptitude, have as much to do with the health, as with the military efficiency, proper, of the soldier. It is undoubtedly true that a state of the highest physical health, will produce, or be accompanied by, cheerfulness and equanimity of mind. *Mens sana in corpore sano.* On the other hand, the power of adaptation to circumstances, the endurance of fatigue and hardship, and the resistance to external morbific influences, are to a considerable extent, dependent upon reason and reflection, and that calm mental state which comes of a conviction of duty. Hence it is, that mercenary soldiers, whether native or foreign, are found in proportionally larger numbers than others, in military hospitals. I do not mean, merely, that they are more given to feigning disease, but that they more readily succumb to morbific influences. It is obvious enough that the mental condition of the recruit, will have little influence in determining his fitness for the military service.

Against the recommendations which I have made in this chapter for preserving the health of armies, it may be objected that the observance of them would materially lessen the number of men who are now called into military service. I might show how the efficiency of armies would be increased, the sickness and mortality rates diminished and the pecuniary outlay lessened by adopting these requirements of a sound military hygiene, but such reflections are so obvious, it would be a waste of time and space to make them. If the choice were left to a humane and judicious general, desiring success from the highest personal and patriotic motives, he would select an army organized from the best materials, although made numerically weaker by the loss of those under twenty-five and over forty years of age, and those deteriorated by constitutional vices.

CHAPTER II.

THE TRAINING OF RECRUITS.

Statistics abundantly demonstrate that the fashioning of recruits into soldiers is injurious to health and destructive of life. In the French service the sickness of recruits is one-third greater than that for the whole army. "It is in the beginning of service," says Tardieu, "that the mortality is greatest." He furnishes in proof of this statement, the following table of mortality for different years of service:

1st year of service,	7.5	loss per 1,000
2nd " " "	6.5	" " "
3rd " " "	5.2	" " "
4th " " "	4.3	" " "
5th " " "	3.	" " "
6th " " "	2.	" " "
7th " " "	2.	" " "

In 1862, according to the "Medical Statistics of the army," the mortality from disease under one year's service was 11.45 per 1,000. In 1863 the mortality under one year's service was 13.28 per 1,000; whilst for all periods of service, it was only 9.16. But few statistics have been published, showing the comparative mortality at different ages in the British service. Those which I have already quoted from Dr. Maclean may be referred to in this connexion, as proving the excessive mortality of the first year of service. Dr. Parkes in his Manual of Hygiene (p. 899) confirms the statements of Dr. Maclean by some facts of his own, obtained by "comparing the amount of heart and lung diseases among the young soldiers, with the same diseases among the invalids of all ages at Fort Pitt in the two years. The following numbers came out:—

	Per centage of lung disease as a cause of Invaliding.	Per centage of heart disease as a cause of Invaliding.
Invalids of all ages,	7.7	19.8
Invalids under two years' service,	14.23	29.29."

Our army for the first two years of the rebellion, was constituted almost wholly of recruits. The statistics of mortality for this period may therefore be compared with the mortality rates of the French conscripts.

	Per 1,000
Mean mortality of recruits in U. S. Army for 2 years,	56.9
Mean mortality of French conscripts for 1862 and 1863,	12.35

It may be objected to these statistics, that in the one case a state of war existed, which greatly increased the mortality; but the casualties of battle and the deaths by violence are excluded, so as to make the conditions in the two cases as nearly uniform as possible. The difference in the results would seem to be due more especially to the different modes of collecting and training the recruits. In France, the administrative service of the army has reached a high degree of efficiency. All of the ordinary contingencies are provided for; depôts are arranged for the reception of recruits, and rules for their hygienical management, the outgrowth of long experience, have been established. In this country, on the contrary, the business of collecting recruits and organizing armies is conducted in a hurried manner; depôts where large numbers of men are huddled together, are improvised, and are, of course, deficient in the machinery necessary to carry on the multifarious concerns of these establishments. A successful issue out of chaos is entrusted to that "organizing tendency" assumed to exist in every mass of human beings. It need occasion no surprise, that under this system recruits become diseased, and that armies waste away in the very act of being formed.

When the outbreak of great wars or revolutions requires that a large part of the adult male population be brought under arms, provision for the proper training and hygiene of recruits, is generally inadequate; hence, as in these States, disorders and irregularities prevail. Under these circumstances everything done, is to supply the need of the moment. In the selection of a site for a depot, little attention is paid to the requirements of hygiene. Convenience and the necessity for preventing desertion are chiefly consulted. The character of the soil, the drainage, the surroundings, near and remote, are not carefully investigated; the necessary conditions seem to the military mind to be fulfilled, if wood and water exist in sufficient abundance. The positions of the tents or buildings upon the chosen site, are regulated by military custom in like cases, or by convenience; and the sunlight, the direction of prevailing winds, and the density of the population per square mile, are disregarded. The amount of space allotted each man in tents or quarters, is governed by the number to be accommodated and not by the hygienic needs of individuals. The care of rations and the preparation of food are entrusted to the raw men, just drawn from civil life, who are unfitted by ignorance and disinclination for the performance of this duty. The

food is wretchedly prepared, the rations wasted or lost, and hunger is frequently added to the other miseries of the depot. Blankets and straw are not sufficient to prevent suffering at night, and hence the recruits lie close together to preserve their warmth. Personal cleanliness is, either not enforced or cannot be attended to. The recruit rarely or never removes his clothing, and the secretions of the sudoriparous and sebaceous glands, united with the cast-off cells of the epidermis and dirt, form a coating which impairs the functions of the skin. During the day, hours of idleness are interspersed with exhausting drills. The camp police is neglected, or very imperfectly performed. The ground about the tents or quarters, soon becomes saturated with urine. The immediate environs of the camp are used in common as a latrine, or shallow sinks filled with ordure, uncovered send forth their poisonous gases. The kitchen offal is thrown upon the ground about the kitchens. The water supply, quickly becomes contaminated by the direct addition to the stream of the ordure and offal, and by the surface drainage of the camp. These evils are not so injurious, probably, as the foul air and foul police of the quarters. A nauseous animal odor is at once perceived on entering the quarters; it adheres to the walls, to the blankets, to the clothing and to the persons of the men. The air of the tent or quarters, is heavy, close and suffocating. Besides the carbonic acid which has taken the place of much oxygen removed by respiration, the air contains volatile emanations from the bodies of the occupants—including a volatile fatty acid—epithelial scales, a fœtid nitrogenous matter—all of those complex and highly injurious substances included under the term *organic matter*.

It must not be forgotten that some of these hygienic evils are inseparable from the military service. For the purposes of war it is essential that men be assembled at given points in large numbers, and in the movements of armies, the military necessity may require that the forces be encamped upon the smallest possible area—a space, hygienically considered inadequate. The most approved measures of hygiene can be efficacious in part, only, against the evils of crowding. A crowded military camp has all the elements of disease present in it, that are found in a large and densely populated city, and many others in addition.

Such, in brief, are the foul hygienic influences into which the recruit is suddenly inducted. By what hygienic means may the health of recruits be best preserved under these circumstances?

Can the details connected with the collection and training of recruits be so arranged and conducted as to diminish the great mortality of this period in the life of the soldier? I may reply to these questions in the affirmative. Much may be done to render less abrupt the change from the experiences of civil life, to diminish the crowding and its attendant evils, to improve the personal hygiene, and to prevent the spread of epidemics. I propose to consider the means by which the hygienic condition of recruits may be improved, under the following heads:

THE HYGIENIC UNIT.
THE PRIMARY DEPOT.
THE GENERAL HYGIENE OF THE DEPOT.
THE PERSONAL HYGIENE OF THE RECRUIT.
MORAL AGENCIES.
THE CAMP OF INSTRUCTION.

1. *The Hygienic Unit.*—There does not exist the same necessity for assembling recruits in large numbers at any given point, as is the case in the movements of armies. It may be laid down as an axiom—the fewer the men collected in a depot, the less the liability to disease. Under ordinary circumstances the number of depots may be sufficient to avoid the chief evils of crowding.

As a regiment (or body of 1,000 men) is the unit of organization of an army, it may also be regarded as the hygienic unit.

A body of this size may be readily provided with all the appliances required to maintain them in a healthy state, and they may be so distributed over the surface of the ground occupied by them as to avoid the evils of crowding. For all the purposes of instruction and discipline, the regimental organization is the best, and the instruction and discipline of a regiment can best proceed, at least as respects the school of the soldier and battalion, apart from other military organizations.

2. *The Primary Depot.*—Assuming that the hygienic unit—a regiment or body of 1,000—is correct in principle, recruits should be assembled in primary depots having a capacity to accommodate this number. Here the instructions, preparatory to more extended military operations, should be conducted. Considered in the hygienic aspect, these depots are intended to prepare the recruit to encounter the sanitary evils of his future military life;—in the military aspect to conduct his military education and training. These two objects need not be made incompatible. In a practical

scheme for preserving the health of armies, the military necessities must be provided for.

What extent of superficial area should the hygienic unit be distributed over in preparing a primary depot? It is obvious that the military necessity does not require that these men be confined to a space no larger than that permitted to the same number of soldiers in the presence of an enemy. With some limitation we may assume that the primary depot can occupy as much ground as the hygienic necessity may require. When desertions are numerous, a smaller space may seem necessary—for the difficulty of guarding a body of men increases with the extent of ground over which they are distributed. Desertion is a moral and military question rather than hygienic; but I may be permitted to observe that, to prevent desertion, something more than military cordons is requisite: the military service must be made desirable, or at least, endurable, by rational men.

According to the regulation standard a camp of a regiment of infantry has a density of population, for the enlisted men, equal to 200,000 per square mile, which is twice as great as the average of London. There can be no necessity for such extreme crowding in the case of recruits in a primary depot. The density of population for them should not exceed the rate of 20,000 per square mile.

The site selected for a primary depot should be convenient to that part of the country from which the recruits are drawn, and as far as practicable movements of recruits should be made along the isothermal, isotheral and isochimenal lines to which they are already habituated. Malarious localities should, of course, be avoided. Exceptions to this rule may be necessary, but in malarious regions great differences in the salubrity of different districts may exist. Low, moist and marshy situations are unsuitable. The grounds should be elevated and have natural drainage in several directions. A clay *soil*, or a clay sub-soil, is objectionable because retentive of moisture. The immediate and remote surroundings of the proposed site should be carefully examined. Distant marshes, low grounds, river bottoms, etc., may furnish malaria which will be transported by prevailing winds; hence, if a depot must be placed in the neighborhood of such objectionable localities, a site to the windward of them should be selected. Hills at the head of ravines, leading up from low, malarious valleys, are generally very unhealthy situations. In countries not malarious, chief attention must be given to the elevation, natural

drainage, soil and sub-soil. It may seem a labor of supererogation to dwell upon these simple details, but any one familiar with army experiences will know how frequently the rules of hygiene are violated in respect to all of these subjects.

The water supply is a most important part of the appliances of a primary depot. Some of the difficulties attending the general question of water supply may be obviated by adopting the hygienic unit for primary depots, for the greater the number of men to be supplied, the more difficult to obtain the necessary quantity of suitable water. Whenever practicable the water of small streams supplied by springs, or pure river water, should be selected, and the *selenitic*, *calcareous* and *mineral* waters should be avoided. Shallow wells, containing surface drainage, should never be used for supplying recruits. To fulfill the necessary hygienic conditions, the potable water should possess the following qualities: it should be free from odor, taste and smell; it should give but a slight precipitate with oxalate of ammonia (lime), nitrate of silver (chloride of sodium), and chloride of barium (sulphates), and should not discharge the color of a standard solution of permanganate of potassa (no organic matter oxydised). The saline and earthy impurities are of much less importance than the organic matter. Indigestion and diarrhœa are produced in recruits by the use of hard waters (selenitic and calcareous). These waters are also unfit for washing. The most dangerous impurity is the organic matter, which may be of vegetable or animal origin, or of both; it may consist of organic substances declining in complexity of constitution as in ordinary putrefaction; it may be amorphous germinal matter in an aberrant state; it may consist of definite forms—cryptogamic and infusorial organisms. Shallow wells, and spring and river waters which have passed through alluvium and by the habitations of men, generally contain notable quantities of organic matter. The influence of this matter in the causation of intestinal disorders—diarrhœa, dysentery, cholera, etc., is undoubted. I have witnessed the production of these disorders on a large scale amongst recruits by the use of water highly charged with organic matter. These effects more surely follow if specific products—cholera, dysenteric or typhoid matters—have gained access to the water supply. Before a site for a primary depot is determined upon, the proposed water supply should be examined. Simple chemical operations will determine the fitness of the water for potable purposes. The "soap test" may be applied to determine

the hardness of the water, and a solution of permanganate of potassa to estimate the unoxydised organic matter. Without going over details which may be found in any chemical work, it will suffice to explain the mode of operation of these tests. When a solution of a potash soap is mixed with pure water, a lather is obtained; but when mixed with water containing earthy bases, the soap is decomposed and the oleic acid combines with the earthy bases, forming a curdy precipitate. When water containing unoxydised organic matter is added to a standard solution of permanganate of potash, the color of the solution is destroyed.

If pure water cannot be obtained, what means can be employed to remove the impurities? Any measures proposed for this purpose must be simple and easily applied: complex chemical processes would, obviously, be unsuited to the special circumstances of the case. The most effective and easily accomplished methods of purification are boiling and filtration. At the boiling temperature, living organisms are destroyed and "germinal matter" deprived of vitality. But as boiled water is not pleasant to the taste, owing to the loss of oxygen and carbonic acid which were dissolved in it, these gases must be restored to it by agitation with air, or by more or less exposure to air when in a finely divided state, as in the process of filtration. Filtration may, also, be necessary to separate visible impurities, and to promote the oxydation of organic matter. Means exist in every camp for accomplishing the filtration of water. The water casks supplied to the quarters, or ordinary pork barrels, may be converted into filters by placing in them alternate layers of sand and charcoal, and connecting a receiver to collect the pure water. A filter of this kind requires to be occasionally exposed to the air to preserve its power. The process of oxydation is necessary to give completeness to the action of the sand and charcoal. If no air can reach the filter, oxydation is at last arrested. When there is a possibility of specific products becoming mixed with the potable water, or when much organic matter of any description is present in it, boiling should precede filtration.

Beside purity of the water, the amount available for supply is an important consideration. There should be an ample allowance, not only for drinking and culinary purposes, but also for bathing. The minimum quantity under any circumstances is 20 gallons per man, daily, but twice this quantity should be furnished if practicable.

The site being suitable and the water supply adequate, the next

point is the preparation of the ground. The alluvium and the decaying vegetable and animal matter should be carefully removed before tents are pitched or barracks constructed. The natural drainage should be improved by artificial canals. The sources of water supply, especially if springs or small streams, should be protected against contamination—if springs, they should be thoroughly cleaned out and walled up—if streams, their banks should be freed from decaying vegetable and animal matter, and stagnant pools communicating with them be drained.

For sudden emergencies—war happening to a people either unprepared, or too impatient to make suitable preparation—tents are the most available means of sheltering recruits. They are expensive considered relatively to their durability, and as ordinarily constructed and used, are exceedingly unhealthy. A tent is popularly considered to admit air freely on all sides, but practically this view is erroneous. The air in tents rapidly becomes vitiated by respiration and the organic emanations from the occupants, and crowding in tents is little less injurious than crowding in permanent quarters. The provisions for ventilating them are inadequate, and if made sufficient, are practically useless because under the control of the men, who, in cold or rainy weather, are careful to exclude the external air. If tents are used for the construction of a primary depot, the essential point is to provide a sufficient number to avoid crowding. If crowding be avoided, it matters little what particular pattern of tent, or patent ventilating contrivance, be adopted. In a tent occupied by several individuals, the minimum allowance of air-space is 200 cubic feet per man. To diminish the sanitary evils of the tent as a habitation for recruits, it should be floored with boards elevated six inches above the surface of the ground. No cause of disease is more potent in the primary depot than lying upon the damp ground, saturated, as it soon becomes, with organic matter in a state of change, or upon damp, mouldy and decomposing straw. The center of the ground floor of the tent should be the point of highest elevation, and a deep trench should be dug around the exterior, to insure a dry state of the soil upon which the tent is pitched. In addition to these hygienic precautions, the tents should be repitched and their location changed once every month; but frequent changes will be the less necessary if the tents are supported by frames and properly floored.

Wooden huts, or temporary pavilion barracks, are, for various reasons, preferable to tents. They can generally be constructed

with sufficient rapidity to supply the needs of the time, or, in a war of considerable magnitude and duration, they can be substituted for the tents first employed; and as respects economy, they possess advantages, in that the material of which they are constructed may be sold when no longer required. Badly-made and imperfectly ventilated barracks are greater evils, hygienically considered, than crowded tents; hence, pavilion barracks for primary depots should be constructed after the most approved models. The first and most important requisites are sufficient air-space, and provisions for securing a constant renewal of the air. These objects may be accomplished by having ample window space, ridge ventilation, and in addition, for winter, a heating apparatus which includes ventilation. The importance of isolation is now distinctly recognized; as few men should be under the same roof as possible; hence, the necessity for separate pavilions, and for restricting the size of them within certain well-defined limits. I have already indicated the density of population per square mile admissible for the primary depot. If this hygienic law be observed, the amount of space between the tents or barracks will be sufficient to insure the free passage of air, rendering any special arrangements of the individual tents or barracks of little importance. Under no circumstances, however, should the arrangement of the depot be such as to prevent free access of air to all parts of every tent or house. An abundant supply of air is the first requirement of hygiene, to which all questions of convenience or expediency must be subordinated. In a suitable ground plan for a primary depot, it will be seen that these conditions may be observed, and at the same time, convenience of administration need not be overlooked. Each of the pavilions is intended to be two stories in height—the first floor to be occupied by kitchen, dining and day room, commissioned and non-commissioned officer's quarters; and the second story to be fitted up as dormitories, provided with ridge ventilation for summer use and ventilating shafts for winter. The air space allowed to each occupant of the dormitory, should be 800 cubic feet. To insure frequent renewal of the air is easy during the months of summer temperature, but in the winter there are some difficulties attending it. An inexpensive expedient of undoubted utility, generally adopted during the late war, for heating hospital wards, consists of the following arrangement: the heating stove is surrounded by a metallic cylinder to which the external air is admitted by means of a shaft passing beneath the floor; the pure air being heated,

rises and is uniformly distributed throughout the room; and the air vitiated by respiration is conducted through the roof, by an exit pipe extending nearly to the floor. To insure an upward current through this pipe, the discharge smoke-pipe passes through it, furnishing sufficient heat for this purpose.

It seems to be a labor of supererogation to enter with any degree of particularity, upon the description of the barracks proposed as suitable for the primary depots. They are now so well known and have so large an experience in their favor (Crimean War and Rebellion) that it would suffice to say, that they are, as respects hygienical considerations, perfectly adapted to the purpose here contemplated.

3. *The General Hygiene of the Depot.*—The interior arrangements of tents and barracks are matters of some importance. It should not be forgotten that the central idea in the management of recruits is, to render the change from the experiences of civil life to the experiences of the soldier, as little abrupt as possible. Usually during the late war, the recruits were furnished a little straw and two, or possibly three blankets. The straw was thrown upon the ground, where it underwent the putrefactive decomposition, mixed with various kinds of animal and vegetable matter, and was rarely renewed or the tent cleaned. Hardly any error of hygienical management, is more serious in its results than sleeping on damp straw, upon damp ground, especially if poisoned by the organic emanations of previous occupants. The results are especially serious in the case of recruits just drawn from civil life and not at all habituated to such experiences. These dangers are altogether irrespective of the fungus discovered by Salisbury on damp straw—a *penicillium*, supposed by him to be causative of camp measles. This demonstration by Salisbury is not sufficiently supported by facts, to warrant us in adopting it as a true explanation. Nevertheless, the rapid development of these minute organisms upon the damp straw of the soldiers' tents, is a proof of the exceeding unhealthfulness of such a bed. It is very desirable that the primary depot be supplied with bunks, which may be of the simplest construction, consisting merely of a frame arranged to hold the bed-sack when filled with straw, and supported by posts high enough to elevate the bed a foot or more above the ground or floor. The straw should be renewed and the bed-sack washed once a month. A small pine table and a wooden stool should be assigned

to each bunk; otherwise the bed becomes the receptacle of all manner of nuisances and is used as a seat.

The utmost cleanliness of the quarters should be enforced. Immediately after reveille, the blankets should be well shaken, neatly folded and placed on the foot of the bed, and once a week should be exposed to the direct rays of the sun. A most pernicious custom is the weekly washing and scrubbing preparatory to the usual Sunday morning inspection. This spasmodic effort atones for six days of uncleanliness, and the resulting dampness of the walls and floors is a frequent cause of disease. Careful sweeping, only, is required, except at rare intervals, when the floors may be scrubbed, suitable precautions being taken to dry the quarters thoroughly before reoccupying them. Frequent applications of lime whitewash, are of unquestioned hygienic utility. Constant supervision is necessary to prevent interference with the ventilating apparatus.

The chief means for preventing the origin, and arresting the spread of the contagious and epidemics, are cleanliness and ventilation, but they should not be relied upon exclusively at the primary depot. An enlightened system of disinfection, should constitute a part of the hygienic means. The influence of the sulphurous and nitrous acid gases, of chlorine and of carbolic and cresylic acids, in the destruction of infectious matter, is now universally admitted. Whether epidemics be prevalent or not, the quarters of recruits should be thoroughly fumigated once a week. The best agent in respect to efficiency and economy, is sulphurous acid, which may be readily enough generated by the combustion of sulphur. When fumigation is practiced, the occupants should leave the quarters, and the gas should be evolved in large quantity and be allowed to remain several hours. The clothing and bedding should be exposed to the action of the gas. Chlorine is objectionable because it enters into combination with lime wash on the walls, forming the deliquescent chloride of lime. On the other hand, sulphurous acid uniting with lime, forms the colorless sulphite of lime, which continues the disinfectant action. Sulphurous acid destroys vermin, decomposes organic matter—and the facts authorize the assertion—arrests the spread of contagious diseases by destroying the vitality of *materies morbi*. In addition to sulphurous acid fumigations, the floors of the quarters should be occasionally washed with a weak solution of common or impure carbolic acid.

The cleanliness of the persons of recruits is so essential to their health, that no means should be left untried to promote it. The

first requisites, are an abundant supply of water and conveniences for bathing—if these are wanting, everything is wanting. Even if the quantity of water be no greater than twenty gallons per man daily allowance, which I have stated is the minimum, this will be sufficient, if judiciously expended, to permit the necessary bathing.

A lavatory should be near to, and yet distinct from the barracks. A very suitable arrangement consists in a combined latrine and lavatory—the water from the latter being used to flush the soil pipes of the former. The combined lavatory and latrine should be placed fifty yards in the rear of the quarters, there being one for each pavilion. A simple frame structure having ridge ventilation, divided by a central partition, and large enough to contain the bathing and latrine troughs; water laid on derived from mains or from a well sunk in the subsoil, are the elements of the proposed plan. The most difficult to arrange in a perfectly satisfactory manner, is the latrine. A very admirable and inexpensive arrangement which I have seen used on a large scale consists of a water-tight wooden trough with water laid on, covered with a moveable seat containing the necessary holes, and furnished with a large exit pipe secured by an iron weight. If there be a sufficient supply of water, no form of latrine is preferable to this; no odor is perceived even after prolonged use, and it is easily maintained in a cleanly condition. If it be necessary, the trough is readily disinfected, by the addition of sulphate of iron to the water, but no deodorizer is superior to a full supply of water in motion. The soil pipes must have ample capacity and sufficient fall to prevent accumulation of soil, and they must discharge at a point remote enough to prevent the privy odors reaching the quarters. A matter of the greatest practical importance, is to have the soil pipes so discharge as to prevent the possibility of contamination of the potable waters.

The latrine as ordinarily constructed and used at the primary depot, or the neglect to provide any, has been a fruitful source of mischief. There can be little doubt, I think, that the discharges of epidemic dysentery, of typhoid fever and of cholera, contain the morbific principles of those diseases. The air becomes poisoned by the evaporation of the liquid portion of the feces and by the solid portion in the form of dust; and the water by the surface drainage of the camp. The latrines with which recruiting depots are supplied, usually consist of nothing more than shallow pits, open to the external air. Sometimes rough seats are placed over

the pit, but not unfrequently the seat is nothing more than a pole. The exposure and discomfort attending the act of defecation while suspended on a pole, either deters men from obeying the call to stool, or impels them to the use of the grounds around the camp. These are powerful reasons why much attention should be given to the construction of suitable latrines at the primary depot.

No matter what may be the form of latrine adopted, it is necessary to disinfect with the utmost care, either by an ample allowance of water or by special chemical agents. If the common pit be the form of latrine in use, disinfection is more imperatively demanded. Experience has shown that the sulphate of iron is the best agent for this purpose in the proportion of 5 pounds to 50 gallons of fecal matters. To destroy the vitality of specific products, impure carbolic acid, carbolate of lime, common coal tar, or charcoal and lime, should be added daily to the contents of the pit. The most important of these agents is the carbolic acid in some of its forms. The efficacy of this is increased by the addition of sulphite of lime. A combination of this kind is the well-known McDougall's disinfectant. Every recruiting depot should be liberally supplied with this, or some disinfectant having a corresponding action, and it should be freely used after the application of the sulphate of iron.

The construction of suitable latrines cannot be made to take the place of sanitary and police regulations. To preserve the health of recruits and to prevent the spread of epidemics (cholera, dysentery, typhoid, etc.), it is necessary to compel the use of the latrine so that specific products may not be deposited upon the ground in the vicinity of the depot. Constant vigilance is necessary to preserve the cleanliness of the ground and to prevent direct addition of morbific matters to the potable water.

The construction of lavatories and latrines involves the question of water-supply and the means required to make the supply available. The methods used to supply camps and garrisons are generally of the most primitive description, and considered relatively to their cost, are inexpedient. Water carts are employed and they involve the labor of men and horses. A small pumping engine, of the value of $1,000, will easily supply a primary depot—a work which would require the labor of ten men and twenty horses, employed every working hour in the day. A reservoir or tank, and distributing pipes, are necessary in addition to the engine. If this method of distributing water be not attainable, the

lavatories and latrines may be provided with surface wells, force-pumps and small tanks placed over the taps, high enough to give the necessary pressure.

Generally speaking, the ration provided for the soldier inured to the service is considered adapted to the needs of the recruit. As respects a certain number of men the military diet is an improvement upon that to which they have been accustomed; with a majority, however, as the case stands in these States, the ration is not equal in amount and variety to the food which they habitually consume. This will appear conclusively enough on examination of the ration issued to the troops of the United States who are more liberally supplied than the troops of any other nation. Before the war of the rebellion the ration consisted of the following:

12 oz. of pork, or	1· 6 oz. of rice.	0·32 gill of vinegar.
20 oz. of beef.	1· 6 oz. of coffee, or	1· 5 oz. desiccated potatoes, or
18 oz. of flour.	0·24 oz. of tea.	1. oz. mixed vegetables
0·64 gill of beans.	2· 4 oz. of sugar.	(desiccated).

During the rebellion, the ration was authorized to be increased—the flour to 22 ounces, and fresh beef to be issued as often as practicable in lieu of salt meat; potatoes were added in the proportion of 1 pound per man three times a week; and it was further provided that when these articles could not be issued in these proportions, an equivalent in value of some other food should be allowed. Amongst regular troops, familiar with the details and economical in the management of their supplies, a considerable fund accrues from the sale of surplus rations (company fund). This is used chiefly to provide additional articles of subsistence; to increase the variety and to enrich the quality of the food. In the case of recruits, this degree of success in the management of supplies is hardly attainable; their appetites are more difficult to appease, and they are wasteful, because unaccustomed to the care of rations and the preparation of food. The ration is insufficient for recruits under existing arrangements, and more than the necessities of soldiers require. We have, in this fact, an illustration of the fundamental error, that what experience has shown is sufficient for the soldier is adequate to the needs of recruits.

That the U. S. Army ration, or the equivalent in value or quantity of some other food analogous in composition, is sufficient to maintain soldiers, and recruits also, in a healthy state, is obvious enough, provided it be put into an available form for the purposes of nutrition. The most liberal provision will scarcely suffice un-

less a corresponding attention be paid to the preparation of food. Men admitted to the military service are almost wholly ignorant of the most elementary knowledge of the culinary art. The confusion of a recruiting depot is not favorable to progress in this kind of knowledge. Notwithstanding this fact, the U. S. Army Regulations require that "at every recruiting depot pains will be taken to form from the permanent party a body of competent cooks, some of whom will be sent with every large draft of recruits to regiments." This regulation is based upon the military conception of competent cooking, which comprehends boiling coffee in a wasteful manner, frying bacon, and preparing an indigestible mixture styled "bean soup." To form a body of competent cooks presupposes the existence of competent teachers of the culinary art—for skill in cooking comes of instruction and training, and is not a gift of nature. Every primary depot of 1,000 men should be provided with a chief cook thoroughly conversant with the methods of preparing palatable and nutritious food from the materials furnished him, and capable of instructing inexperienced men in these culinary processes. All recruits should receive some instruction, and those exhibiting aptitude should be carefully trained, so that companies in the field may be supplied with men skilled in this most important part of a soldier's education. A competent bread baker is as necessary to the primary depot as the cook. Men instructed in these trades may sometimes be found amongst recruits, but in general, they should be hired from civil life, and sufficient wages given to insure the best talent.

A suitable diet for recruits is a matter of the greatest importance. They should not be permitted to fall suddenly from the full and varied diet to which they were accustomed in civil life, to the meagre and unsatisfactory food of the camp; and the cooking of the food should be so accomplished as to satisfy the requirements of a reasonable taste. The giving of a suitable diet to recruits is by no means difficult, even at the rate of expenditure allowed under existing regulations, for these depots must necessarily be in the neighborhood whence supplies are drawn, and the articles in which the ration is deficient, hygienically considered, are much less expensive than the articles furnished. If we assume that the U. S. ration is the most liberal and complete which the resources of the nation permit, and hence, as liberal and complete as can be furnished by any other government to its soldiery, we may adopt it as the standard in our investigations. In what re-

spect may it be improved for the use of recruits? In order to produce a healthy mixed diet, it is necessary to regulate the proportion of animal and vegetable aliment. For the experiences of the field and to resist the influences of climate, the vegetable components of the ration must not readily undergo change—hence, the use of rice, beans and "desiccated vegetables." For the same reasons, bacon or pork is the animal constituent, and beef, "if practicable," because it may be transported "on the hoof," following the movements of troops. It is obvious, in the case of recruits, that for rice and beans may be and should be substituted potatoes, beets, turnips and cabbage—articles always easily procured in the neighborhood of primary depots. One of these vegetables should form a part of the diet every day, and, in addition, all of them should enter into the composition of the soup. As the soup makes the soldier, a Napoleonic maxim hardly to be disputed at this day, it is important that this article of food be well and frequently prepared. Three varieties of soup may be prepared from the materials of the ration: vegetable soup, beef soup and bean soup, and one of these should constitute a part of each day's dinner. Soup is especially desirable, because it may possess, if properly prepared, highly nutritive qualities; is readily distributed to large numbers of men, and may be made satisfactorily in the utensils issued to troops.

The dietary of the primary depot should not be left to the inclinations and caprices of the cook, but should be a matter of regulation—the articles and quantities for each day in the week being carefully prescribed. The utmost excellence of result attainable with the means should be sought for in the cooking of the food, as also, the greatest variety. A diet table constructed with this view should be arranged to suit the peculiar capabilities of each depot. Without going into tedious details it will suffice to state that as large an amount of vegetable food should enter into the composition of the diet, as the resources of the ration will admit. The U. S. ration is large enough to permit some important additions. A saving of 33 per cent. may be made in the flour ration when the bread is baked in the depot, and a part of the pork or bacon ration may be commuted. The money arising from these sources can, under existing regulations, be appropriated to the purchase of additional articles of diet. To secure the best results, and also to avoid wastage which necessarily occurs when cooks and kitchens are multiplied, a general kitchen and bake-house should be estab-

listed in every primary depot—as I have already indicated—for the preparation of the principal articles of diet. An auxiliary kitchen and a dining room will also be necessary to each pavilion. Considerable importance must be attached to the mode of serving the food. The abominable practice of serving out the diet after the manner of giving corn and slops to swine, if necessary in the field is not necessary and should not be permitted in the case of recruits at primary depots. The soup, meat, vegetables and coffee having been brought from the general kitchen to the auxiliary kitchen, should be prepared in the latter to be placed on the dining room table. Boards laid upon trucks, kept clean, make a suitable table, and a plain wooden bench, a seat. The table furniture need be nothing more than that allowed under existing regulations. The most scrupulous cleanliness of tables, utensils and stove in the auxiliary kitchen should be enforced; the walls should be frequently whitened; the floor should be sanded. Ample time should be allowed the men at their meals, and hasty eating should be discouraged. The utmost propriety of conduct should also be enforced. These details are not without importance. The appetite and digestion are much influenced by associations, and the habits of civil life, which the recruit carries with him into his new relations, should not be broken up too rudely. Sufficient interval is not allowed between the meals, or irregularities exist: thus, whilst dinner and supper are frequently but four or five hours apart, seven hours are permitted to elapse between breakfast and dinner. The utmost possible regularity should be observed in the hours for meals and the intervals between them.

To insure the careful preparation of food in accordance with the diet table, to induce personal cleanliness of the recruits, and to maintain a thorough state of police of every part of the primary depot, a system of daily inspections becomes necessary. Abandoned to their own devices, recruits are prone to commit all manner of offences against the laws of hygiene. They need instruction, example, and the fear of punishment to carry out the measures necessary to preserve health. A body of officers skillful to detect errors of hygiene and competent to instruct in correct methods, should make a thorough inspection of quarters, tents, latrines, kitchens, dining rooms and grounds every day. The clothing and persons of recruits should be examined at "Retreat" when paraded for evening roll-call. The senior medical officer of the depot should be a member of this sanitary board, and it should be his

duty, more especially, to take note of all those causes influencing the health of the command. Under existing regulations or "customs of service" this inspecting duty is devolved upon the "Officer of the Day;" but his military duties so occupy his time as to render it impracticable for him to perform the work assigned above to a body of officers especially detailed for the purpose. To insure the adequate performance of this duty, printed forms should be issued containing questions on all matters to be investigated. The inspection being completed and the questions answered, the report should be submitted to the commandant with such suggestions for improving the sanitary condition as may have occurred to the board in the course of their examinations.

If the methods of hygiene, here marked out in outline, were faithfully executed, much of the disease and mortality of primary depots would be prevented. Nevertheless, in spite of every precaution, epidemics may invade a primary depot, and prevail among its inmates. During the war of the rebellion, measles, mumps and small-pox visited many of the camps with great severity, but these visitations were obviously invited by the bad hygiene of these depots. These diseases are so certainly propagated by contagion, that the most strenuous efforts should be made to prevent their communication. Cases occurring should be at once removed beyond the possibility of contact with healthy men. The frequent fumigation of the pavilions or tents and their contained bedding, clothing, etc., in accordance with the recommendations already made, will prove an effective means of preventing the occurrence, and arresting the spread of epidemic and contagious diseases.

4. *The Personal Hygiene of the Recruit.*—As soon as a recruit arrives at a primary depot, his arms should be examined for evidences of a former successful vaccination, and if these evidences are not satisfactory, he should be immediately vaccinated.

As the primary object of a recruiting depot is the military instruction and training of the recruit, it is necessary to inquire how far this object may be made conformable to the requirements of hygiene. Drill, guard duty and police are the chief military employments of the primary depot. Two hours in the morning and two in the afternoon are usually devoted to drill. Heated by the exercise and fatigued by the unaccustomed movements, as soon as released the recruits go to their quarters and lounge upon their beds. The changes in temperature thus suddenly experienced and the check to the cutaneous transpiration are causes of the bron-

chitis, pneumonia and diarrhœa from which recruits so severely suffer. If the drill is active and fatiguing, the recruits should not be dismissed whilst in a heated and perspiring state, but the violence of the exercise should be moderated, giving them an opportunity to cool to the normal temperature before the "recall to quarters" sounds. Generally recruits are over-drilled, worried and fatigued, unnecessarily, especially in the beginning of their military experiences, and are hence prejudiced against the business—a mental state unfavorable to progress in any kind of knowledge.

A needless amount of guard duty is not unfrequently imposed upon recruits. There is no duty which so severely taxes the health of raw men as standing guard at night. Such duty is an essential part of a soldier's education, and cannot be omitted, but the amount of it may be lessened, and the ill effects of it may be diminished by the adoption of certain hygienic precautions. The guard barracks or quarters are usually hot beds of disease, being filthy, ill-ventilated, crowded and dark. The apartments for prisoners are in a worse condition, and these unfortunates are not only deprived of liberty but of air, sunshine, water and suitable food.

I have already indicated that lack of personal cleanliness is a common cause of disease amongst recruits. Frequent bathings should therefore be required, and daily inspections of the persons of the men should be made in order to prevent neglect of this important sanitary measure.

5. *Moral Agencies.*—A considerable part of the time of the recruit is unoccupied. His duties are monotonous. If he be not possessed of some mental resources—and few are so endowed—the time hangs heavy and he becomes a prey to *ennui* and nostalgia. As a relief to the tedium and restraint of his life, the recruit will enter with zest into any dissipation circumstances offer. It is therefore a matter of no small importance to fill up these unoccupied hours with rational amusements. Athletic games and sports should be encouraged by affording the necessary facilities. Those given to reading should have the opportunity afforded them, in a well selected library of readable books. The value and indeed the necessity of providing for the mental wants of recruits will be understood by any one who had the opportunity of seeing the dreadfully licentious books which were circulated so largely in the army during the rebellion.

Under existing habits of military life nothing is more difficult to

accomplish than that particular duty denominated "police." Ideas of degradation are associated with it, because the prisoners in charge of the guard are usually employed for this purpose. At the primary depot every recruit should perform his tour of service in police, not only for the sake of instruction in the duty of cleanliness, but to occupy some of his vacant hours and to make the duty itself respectable, by rendering it obligatory upon all.

6. *The Camp of Instruction.*—The experiences of the recruit at the primary depot are necessarily not of long duration. If his training have not been neglected, he has acquired most useful information in respect to all sanitary questions affecting himself. He may be at once transferred to the field of military operations, or he may be subjected to a further course of military training in the camp of instruction. Here the recruit enters upon a life more nearly allied to the experiences of the soldier.

The camp of instruction is intended to familiarize the soldier with larger military evolutions and to perfect organizations of brigades, divisions and corps. The camp must be situated at a point convenient to the theatre of military operations, and it must have a density of population much greater than the primary depot, in order to accomplish the objects for which it is established. Beside the number of men, the density of population, and the proximity to the seat of military operations, there is no requirement of hygiene proper to the case of primary depots not equally necessary in the camp of instruction. The sanitary evils of the latter are similar to those which we will have occasion to study in the military camps in the field. Troops in permanent camps are more liable to disease than when engaged in active movements, for reasons that are perfectly obvious. In permanent camps they suffer from the effects of crowd-poisoning, bad police, polluted water and contaminated air—evils not so active nor so powerful when camps are frequently changed, and a large extent of country operated upon.

It is of the greatest practical importance that the camp of instruction be not too populous; that it be situated upon ground perfectly well drained and remote from sources of malaria; that the water supply be abundant, neither selenitic nor calcareous, and free from organic matter; that crowding in tents or quarters be avoided; that the diet be sufficient, various and well prepared; that cleanliness of the persons and clothing of the men be strictly attended to; that police of the camp grounds, quarters, kitchens

and latrines be faithfully performed; that systematic sanitary inspections be carried out; and finally, that contagious and epidemic diseases be rigorously excluded. The camp of instruction, indeed, should consist of a collection of primary depots, each a hygienic unit, organized and conducted as herein described.

In a military command so much depends upon the commandant that I may be permitted to make a few observations upon the qualifications of that officer, so far as those qualifications affect the sanitary situation.

The commandant of a primary depot or camp of instruction should be equally removed from the martinet and the totally ignorant militia man. He should be a man of sense, discretion and resolution, but above all, he should possess the attribute of humanity. He should have not only a competent knowledge of the art of training soldiers, but a full acquaintance with the rules and methods of hygiene. Whilst wisely considerate of the feelings of men just drawn from the employments of civil life, he should have the resolution to enforce the sanitary measures necessary to preserve their health.

Wisdom in the construction of depots, elaborate regulations for their management, and abundance of supplies, will avail little if the commandant be a fool.

It may be objected that the plans proposed for preserving the health of recruits are inapplicable because of the expense attending the execution of them. A soldier costs the government of the United States about $1,000 by the time he is fitted for the field, and that sum is irrespective of bounty or other allowances for inducing him to enlist. Independently of its humanitarian aspects, it is a desirable thing in the pecuniary sense to preserve the health of every recruit. If, during the rebellion, those had been saved by a proper system of hygiene who were lost for the want of it, all the necessary appliances for primary depots and camps of instruction might have been provided, without additional strain upon the resources of the country.

CHAPTER III.

THE EXPERIENCES OF THE SOLDIER.

"Is there truth in the statement, that a degree of health which is unusual prevailed in the Union armies during the late war, and that the mortality from disease was much below the average in the great campaigns of Europe?" The solution of this problem is invested with great difficulties, for the reason that there are so many factors, whose precise value can hardly be estimated, influencing the result. Amongst these are epidemics, as cholera; climatic changes; the state of the commissariat and of other departments of the administrative service, etc. All of these should be remembered in drawing conclusions from statistical tables comparing sickness and mortality rates of different armies. Dr. Woodward has fallen into the error, as I conceive, of neglecting to ascertain the importance of these several factors, in the statements made in *Circular No. 6*, about the relative mortality in the United States, French and English armies. "It is thus seen," says Dr. Woodward (p. 94), "that the losses of our troops from disease during the first half of the recent struggle were, proportionally, much less than those of the allied armies in the Crimea." To arrive at this result, he computes the annual losses of the French army in the Crimea at 300 per 1,000 of mean strength. He is, certainly, mistaken in this estimate. I find, upon examination of the report of Marshal Vaillant, Minister of War, that the total number of the French army sent out to the Crimea was 309,268, and of these 227,135 were brought back, making a total loss, including the casualties of battle, desertion, &c., of 82,133. This loss is at the rate of 265 per 1,000 of mean strength for the whole period of 28 months, or a mean annual loss, including killed and wounded, of 119 per 1,000 of mean strength. Let us compare these figures with certain mortality statistics of the U. S. Army:

	Per 1,000.
Mean annual mortality of the U. S. Army in the Central Region (Circular No. 6)	54.56
Mortality from disease of the U. S. Army in Mexico	103.8
Mean annual mortality, from all causes, of the French Army in the Crimea	119.1

The mortality of the French army included the losses from an epidemic of cholera, gunshot wounds and the killed in action. If we separate these, the result will scarcely justify the congratulatory observations of Dr. Woodward. A juster comparison may, how-

ever, be made between the sickness and mortality rates of the French army in Algeria and those of our army during the rebellion. I find in the *Rapport sur les Progrès de L'Hygiène Militaire par M. Michel Levy*, 1867, the following:

Year.	Mortality per 1,000 of mean strength.
1862,	22.2
1863,	12.3
1864,	21.1
1865,	16.2
Mortality for the first year of the Rebellion, including Atlantic, Central and Pacific Regions,	41.45

An instructive comparison may be made between the sickness rates of the French army in Algeria and those of our army for the first year of the rebellion. In 1861, in a mean strength of 54,000, there were admitted 27,500 men to the military hospitals, being in the proportion of 512 per 1,000. In the United States army for the same period the proportion was 2102 per 1,000 of mean strength.

The foregoing figures, rightly interpreted, do not indicate an unusual degree of health in the Union army during the late war. That there has been a marked and rapid improvement in the hygienic condition of armies during the present century, in which we have been rather the rearguard than the vanguard, will appear in the further elucidation of this subject.

In comparing the mortality rates of the U. S. army with those of the British army in the Crimea, Dr. Woodward assigns 222 per 1,000 of mean strength as the mortality rate of the latter. The figures are as follows:

Mortality of the British Army in the Crimea per 1,000 of men strength,	222.
Mean mortality of the U. S. Army for the first two years of the rebellion,	56.9

Is there any explanation of this extraordinary difference? In the first place, the British army lost 4,513 men by cholera, being one-fourth of the losses by disease. In the next place, the causes of disease were rife during the first winter in the Crimea. All the facts are exhibited in the following extract from the *Report of the Commission appointed to inquire into the regulations affecting the sanitary condition of the Army, Op. cit.*, p. 31:

"Throughout the winter of 1854–5 the troops were suffering from work altogether disproportioned to their strength, from broken rest, insufficient clothing and shelter, unwholesome food and want of cleanliness. As the spring advanced, to these causes of disease and mortality were added others arising from want of

drainage and ventilation, and the nuisances resulting from the lengthened occupation of the same ground without sufficient countervailing precautions. Throughout the period of seven months, from October 1, 1854, to April 30, 1855, the rate of mortality rose as high as 600 per 1,000 per annum. But in November and December of 1855, with supplies abundant, food of a wholesome character, and improving sanitary conditions, the rate of mortality per 1,000 per annum had already fallen to 44 and 32; and with huts well drained and ventilated, nuisances removed, and the camps thoroughly cleansed, from January to May, 1856, the rate of mortality of the army in the Crimea per 1,000 per annum fell to 12½, and in May to 8."

With what period in the experiences of the British army in the Crimea shall we compare the mortality rates of the U. S. army? It is perfectly obvious, the conditions being so various, that a comparison of the statistics in the gross and unaccompanied by any explanation would convey no useful lesson. The period of greatest freedom from disease, coincident with the most complete sanitary regulations, may be compared with the mortality rates of our troops serving in the "Pacific Region" where "the conditions approached those of peace:"

Mortality of the British Army in the Crimea for the five months ending May 31, 1856.....12.5 per 1,000
Mortality of U. S. Army in Pacific Region under conditions which approached those of peace,.....10.01 "

That climatic conditions, even when no considerable difference exists between the isothermal, isochimenal and isotheral lines to which the troops are habituated, and those in which they serve, exert no inconsiderable influence over the mortality rates, is shown in the differences between the Atlantic and Central regions:

Mean mortality of Atlantic Region,.....37 per 1,000
Mean mortality of Central Region,.....85 per 1,000

If we take no note of these important factors in the production of army diseases, our statistical statements will possess little value. If we simply compare the mortality rate of our armies as a whole with those of England and France in the Crimea, the result is more favorable to the sanitary state of the former than the facts warrant:

Mean annual mortality of U. S. Army for 1852 and 1853 (excluding Pacific Region),..... 68.48 per 1,000
Mean annual mortality of English Army in the Crimea,.....202. per 1,000
Mean annual mortality of the French Army in the Crimea.....160.3 per 1,000

The recent campaign of the Royal Prussian army, terminating in the decisive battle of Sadowa, furnishes us with statistical data based on experiences more nearly correspondent to those which obtained in the Union army. These figures were procured from an official publication entitled *Die Verluste der Königl. preussischen Armee an Officieren und Mannschaften*, etc., Berlin, 1866. The campaign occupied one year. Its mortality rates may therefore be fairly compared with the mortality rates of the U. S. army for the first year of the rebellion:

Mortality from disease in the U. S. Army for the year 1862 (Pacific Region excluded)	96.36 per 1,000
Mortality from disease in the Prussian Army for the year 1866	11.4 per 1,000

The extraordinary difference in mortality, as exhibited in these statistics, is due to causes set forth in Chapter I. of this essay. Whilst the U. S. army was composed, with an insignificant exception, of inexperienced civilians most imperfectly organized and trained, the Prussian military force was drawn from the regular military establishment and from the landwehr of the first ban, the flower of the population. None of the men engaged in this campaign were less than twenty years of age; four-fifths had had the training and experience of two-and-a-half years' service, and all were more or less familiar with the usages and experiences of military life. In addition to the well-selected material of which the Prussian army is constituted, the military administration is the perfection of order, economy and efficiency—qualities the opposite of those which obtained in our army during the rebellion. A considerable part of the mortality in the Prussian army was occasioned by cholera. With this exception, the conditions in the two cases are similar. Certainly no important departure from the isothermal, isochimonal and isotheral lines to which the men were habituated occurred in either case. We may therefore, with some confidence, ascribe the superiority in the sanitary condition of the Prussian army, to the excellent administrative service of that army, by virtue of which, not only are recruits carefully trained to bear the experiences of the soldier, but the details of field service are so arranged as to secure the utmost exemption from disease.

The English and French troops in the Crimea were, with a few exceptions, operating in a climate to which they were unaccustomed; an epidemic of cholera attacked them; unusual difficulties were experienced in supplying them; they occupied permanent camps. Corresponding experiences did not happen to our army.

To compare the sickness and mortality rates will not, therefore, furnish the precise information desired. The statistics of individual diseases, occurring under the same conditions, will, on the contrary, indicate the real difference in the state of the armies, and suggest the causes of the differences.

An examination of the sickness and mortality rates has shown the progress of improvement in the hygiene of armies. A comparative statement will exhibit in what army hygienic measures have achieved most successes:

Mean annual mortality in British Army during fifteen years, ending 1853	33	per 1,000
Annual mortality at present time for all stations about	20	per 1,000
Annual mortality for home stations about	12	per 1,000
Mortality of U. S. Army in Mexico	103.8	per 1,000
Mean annual mortality for first two years of the Rebellion, excluding Pacific Region	69.43	per 1,000

If we compare two periods of the Crimean war, the influence of sanitary regulations is exhibited in the most striking manner:

Mean annual mortality from January to May, 1855, of British Army before Sevastopol	630	per 1,000
Mean annual mortality from Jan. to May, 1856	32.5	per 1,000

If we compare these figures with our experiences during the first two years of the rebellion, the advantage rests with the British, for although our mortality rates never rose so high, yet the influence of an improved hygiene was never so signally manifest:

Mortality for the first year of the Rebellion, including the three regions	41.43	per 1,000
Mortality for the second year of the Rebellion, including the three regions	48.44	per 1,000

The most satisfactory statistics, exhibiting the great improvement which has taken place in the last quarter of a century in the hygienic condition of armies, are those of M. Levy (*Rapport sur les Progrès de l'Hygiène Militaire*, op. cit., pp. 8–9):

	Home.	Algiers.
Mean annual mortality per 1,000 of mean strength of the French Army at home and in Algiers for the five years ending 1846	19.6	63.9

	Home.	Italy.	Algeria.
Mean annual mortality per 1,000 of mean strength of the French Army at home, in Algeria and in Italy for the four years ending 1865	9.10	14.47	15.15

M. Levy attributes the improved hygienic condition of the French army to the improvement in the housing, food, clothing, exercises,

in a few words—"to all the details of the hygienic *régime*." We have seen that the same hygienic means accomplished a marvelous work in the British army in the Crimea. It becomes necessary, therefore, to study somewhat more in detail the nature and *modus operandi* of these hygienic means for improving the sanitary condition of armies.

Statistics prove, that the military hygienist has not so much to fear from fatiguing marches, exposure to the vicissitudes of the weather and climatic changes, and the sometimes scanty diet of troops in the field, as from the sanitary evils of permanent camps and barracks. This statement is exemplified in the following:

Mortality of the British Army before Sevastopol during 22 weeks, ending May 31, 1856,.....17.5 per 1,000
Mortality of the British Infantry when quartered in England,.....17.3 per 1,000
Mortality of the Guards when quartered in England,.....20.4 per 1,000

In the field the mortality from disease is much greater than from the casualties of battle. This fact is shown in the statistics of the first two years of the rebellion by a comparison of the miasmatic diseases alone with injuries:

First year.	Cases of miasmatic diseases,	436,717
	Cases of wounds and injuries,	44,000
Second year.	Cases of miasmatic diseases,	313,756
	Cases of wounds and injuries,	98,475

The usual ratio between the losses by disease and by the casualties of battle was not observed in the late campaign of the Prussian army. The following are the statistics:

Total deaths,.....10,817
Deaths from disease,..... 6,427

These figures reflect the highest credit upon the administrative service of the Prussian army.

In the Crimean war the losses of the British army were in the following proportion:

Losses from sickness,.....16,211
Losses from wounds (not including killed),... 1,761

In the period embraced from October, 1854, to April, 1855, having a mean strength of 23,175, the losses from sickness were 9,248, and from wounds only 698. According to M. Scrive, during the same period, the admissions into the French field hospitals were 15,500, of whom 14,000 were for diseases and 1,500 for wounds.

According to Circular No. 6, the mortality from wounds was, for the first year of the war, 16.7 per 1,000 of mean strength, and for the second, 18.7 per 1,000; whereas, the mortality from sickness (excluding the Pacific region) was, for the first year, 60.48 per 1,000, and for the second, 65.77 per 1,000. The usual ratio of sickness to wounds is as 10 to 1, and this proportion existed in the Union army. The proportion is very nearly the same for the British army in the Crimea, if the calculations are made from the statistics of the whole period. So far, then, as these figures prove anything, they do not exhibit an unusual degree of health in our army during the rebellion.

The sources of danger to the health of soldiers are manifold. As respects the troops of the United States we have, in a Sanitary Commission document (*No. 41. Two Reports on the condition of the military hospitals at Grafton, &c. Asst. Surgeon W. A. Hammond, U. S. A.*), some striking statements of the causes producing disease during the rebellion. I have, myself, repeatedly observed the same facts, but for obvious reasons, I prefer to employ in illustration of my argument the statements of others:

"The 55th has been five months in service, and has been stationed at Grafton since the 11th of February. The camp is located on a knoll on the south side of the river, and as far as situation goes, it may be considered advantageously placed. The soil and subsoil are clay, which is bad on account of its retaining moisture for a long time. At present the mud is six or eight inches deep all over the camp ground.

"The tents are in a very bad state of police, and for a permanent camp overcrowded. They contain from ten to fourteen men each. The effluvia from them on entering was stifling. The straw is changed once a week. The tents have not been struck since the regiment has been at Grafton, and consequently, the ground over which they are pitched must be reeking with gaseous emanations from the men. They are partly floored; the boards are not placed upon joists, but directly on the ground.

"The camp sink is located between the tents and the river. It is covered with fresh earth twice a week, when the medical officer specially sees to it. The men, generally, however, make use of the ground in the vicinity. * * * The men are now inhabiting a space of 30,000 square yards, and the population of the camp is at the rate of 1,000,000 to the square mile. * * * *

"The measles appeared in this regiment on the 19th of February,

At that time 165 men of the command had never had that disease; of this number 100 have since had it. The probability is, that unless something is done to arrest its progress the remaining 65 will have it. There has been a good deal of other sickness, consisting principally of chest affections, diarrhea and dysentery. At present there are, as near as can be ascertained, 120 sick; which, in a force of 950 men, is excessive. Since the regiment has been at this place ten men have died; one of typhoid fever, one of pneumonia, and eight of measles."

Macleod (*Notes on the Surgery of the Crimean War*, p. 34) thus graphically describes the influences affecting the health of the British army in the Crimea:—"Day after day passed in severe bodily exertion and anxious watching—one moment digging laboriously in extending the approaches, and the next with arms in hand repelling the assaulting enemy; almost always wet; exposed without cover to the drenching rain and soaking snow, the keen frost and biting wind; standing for days in wet mud; constantly either unnaturally excited or depressed; ever in danger, and without hope of a change; their dirty, humid clothing in rags, their bodies covered with loathsome vermin which seemed to grow out of their very flesh; no comforts in their wind-pierced tents on the bleak plateau; no fires unless, weary and footsore as they were, they dug beneath the snow-covered soil for wet roots wherewith to kindle a feeble and tantalizing blaze; without food till, after hours of persevering exertion, they managed to half cook their unpalatable ration over their winking fire; huddled into a crowded tent to pass the night in a close, noisome atmosphere, on the cozy ground, covered by the same blanket which protected them in the wet and muddy trenches." Miss Nightingale, in her replies to the questions of the "Commission appointed to inquire into the regulations affecting the sanitary condition of the Army," states as follows (page 362, Evidence):

"During November, December, 1854, January and half February, 1855, the prevailing diseases were of the scorbutic type, viz.: diarrhœa, dysentery, frost-bite, rheumatism, such diseases as generally arise from bad food, deficient clothing, fatigue, exposure and damp. During the latter part of February, March, April, 1855, the scorbutic type declined; and diseases of the malarial type, typhoid, continued and remittent fever, dysentery, diarrhœa and cholera began to prevail—to a great extent the result of bad drainage, bad ventilation, overcrowding, nuisances, organic effluvia, malaria and damp."

In the foregoing facts we discover a clear indication that the primary evil to be overcome by the military hygienist is *crowd-poisoning*. Under this term may be included crowding, deficient ventilation, bad police, lack of personal cleanliness—all of those hygienic evils, indeed, growing out of the accumulation of men in large numbers on a space of ground inadequate for the purpose, and unprovided with the appliances necessary for maintaining them in good sanitary condition. Next in importance to crowd poisoning we have *malaria*, and then *overheat*. The simultaneous action of these causes induces a *composite morbid state*, in which the influence of each cannot be exactly determined. In addition to this compound morbific cause, various contagious and epidemics affect the health of armies: *eruptive fevers, continued fevers, dysentery, cholera*, etc.

Crowd-poisoning and the means of prevention.—The evils of crowd poisoning become manifest immediately upon the concentration of troops in camps preparatory to field operations, and they increase with the lengthened occupation of the same ground. Active movements, by distributing the men over a larger extent of country and by bringing them continually in contact with fresh air, diminish the evil effects of crowding. All observers agree that troops on the march are much less affected by the various forms of camp diseases; that, indeed, the percentage of sickness and mortality is reduced somewhat below that of the same ages in civic occupations; but when the movements cease the sickness rates rapidly increase. On the march the men have every variety of muscular movement; frequent changes of scene stimulate the imagination, and no camping ground is occupied a sufficient length of time to become poisoned by the excreta of its occupants. In the permanent camp much of the time is spent in idleness; the drill and other duties are monotonous, and the crowd-poisoning quickly inaugurated, progressively extends its influence and increases in intensity with the length of occupation. It is obvious, therefore, that a permanent camp will require much greater space for each tent than a temporary camp, but no considerations of hygiene, conflicting with the military necessity, can be entertained when the camp is to be established in the presence of an enemy. As the lives of troops are risked in battle when an object is to be accomplished, so, also, they may be risked by exposure to the causes of disease, if, by so doing, the desired success may be achieved. Such is Vegetius' idea of the duty of a soldier: *cui necessitas belli necessitas et mortis.*

According to the regulations of the U. S. army "each company has its tents in two files, facing on a street perpendicular to the color line. The width of the street depends on the front of the camp, but should not be less than 5 paces. The interval between the ranks of tents is 2 paces; between the files of tents of adjacent companies, 2 paces." This is a density of population, for the enlisted men, of about 880,000 per square mile, but as 22 paces are permitted between regiments, for the whole of a division or corps encamped at the same rate, the density of population would be about 400,000 per square mile. This rate of density of population is nearly ten times greater than obtains in New York, a city well paved and drained and provided with other appliances of hygiene not at all attainable in a military camp. A similar degree of crowding was provided for in the camping regulations of the British army in the Crimea. "The Quartermaster General's instructions for camping, issued at the commencement of the Crimean war, authorized densities of population on the camp surface equal to 347,000, 518,000 and 664,000 inhabitants per square mile. The lowest of these densities is double that of the most densely populated district in England. It includes not only the ground actually covered by tents, but all the open spaces in camp. The ground actually covered by tents in these plans of encampment gave a density of population equal to 1,044,480 per square mile."—(*General Report of the Commission appointed to Improve the Sanitary Condition of Barracks and Hospitals*, p. 168.)

During our late war there existed the most flagrant violations of the principle of expansion in the arrangement of permanent camps. The degree of crowding, authorized in regulations, was generally exceeded. If a sufficient area were occupied by the armies as a whole, individual regiments, brigades and divisions were compressed into the narrowest limits, leaving wide interspaces unoccupied. This vicious method of camping troops was well seen in the winter camps of the Army of the Potomac, and of the Army of the Cumberland. In all of these instances, there appeared no strategical or other military reasons for having a uniform density of population greater than 40,000 per square mile. This should be considered the maximum density under the ordinary circumstances of permanent or winter camps. This rate of density would give each man 87 square yards, assuming that the distribution of the command was uniform over the whole area included within the boundary of the camp. Unfortunately, this was not the case. The force

encamped at Chattanooga during the winter of 1863–4 occupied, in the aggregate, a space greater than that which we have indicated, but individual regiments and brigades were compressed within limits almost incredibly small—in many instances encamped at the rate of more than a million per square mile. Military necessity could not be urged in extenuation of this extraordinary violation of the rules and principles of hygiene, for ample space existed within the limits of the works erected for defence to permit a density of population less than 40,000 per square mile. The effect of this disregard of hygienic considerations was exhibited in the increased number of cases of fever, pneumonia, dysentery, etc., and in a greatly increased mortality. The excessive crowding of the British army in the Crimea was an efficient cause in the production of that fearful mortality which occurred from October, 1854, to April, 1855.

Crowding is seen, not only in the accumulation of men at a given point, but in the number assigned to each tent or hut. This is an evil in many respects more fatal than the preceding. If a military man, familiar with the facts, be asked—What was the most admirable feature of the winter camps of our various armies during the war?—he would reply, most probably—The skillful manner in which the men protected themselves against the vicissitudes of the weather by building huts. Unfortunately for the military enthusiasm on this subject, it is certainly true that these huts were erected in opposition to the plainest requirements of hygiene. They had no windows, no arrangements for ventilation, and were so crowded that the occupants had not, in most instances, 80 cubic feet of air space. Ponchos and shelter tents, which they used in active movements, would have been vastly better in the hygienic sense.

What are the best means of sheltering men in a winter camp? As the length of time for which such a camp is occupied on this continent does not exceed, on the average, five months, it is not desirable to erect any but the most temporary structures. If the material exist on the ground, or in the vicinity, suitable for the purpose, huts may be erected upon the plan already suggested for the primary depot. Ridge ventilation, ample window space to insure sufficient light, and a capacity to permit each man 800 cubic feet of air space, are the requisites in such structures. A serious objection to huts as usually built, is the lack of light, and this deficiency is associated with a corresponding one—want of air. The occupants of these dark and ill-ventilated huts, as was ob-

served in the Crimea and during the rebellion, become pale and anæmic, and feeble and emasculated in mind as weakened in body. The huts should be so arranged as to permit the free circulation of air around them, and to have the sunshine on each side. The floor of the hut should not be placed immediately upon the ground, but a space should be left to allow the air to pass under it, and the boards should be movable, to permit the ground beneath to be occasionally cleaned. If a wooden floor cannot be placed for want of material, the soil should be removed and clean sand or gravel be substituted, and this should be renewed frequently. The ground within the hut should be well drained, and a deep trench should be dug around the hut to carry off the moisture and rain water. Drains and trenches should also be dug to cut off the surface water flowing from higher ground. The best means of warming the hut is by an open fire-place, connected with an underground flue reaching several feet beyond the walls.

If materials for building huts be not available for winter and permanent camps, tents must be used for sheltering men. Of these, patterns almost innumerable have been proposed to supply the hygienic necessities. The Sibley tent, the bell tent, the tent d'abri, the wedge tent, may each and all be used: the pattern of the tents, as already intimated, is of less importance than attention to the amount of air-space available for each individual occupying them. The Sibley tent is 18 feet diameter at the base, 13 feet high, conical in shape, and having an opening at the top, guarded by flaps, for ventilation and to permit the escape of smoke. This gives a capacity of about 1,100 cubic feet, in which space fifteen men are crowded—an allowance less than 75 cubic feet of air-space per man. The wedge tent has a cubic space of about 400 feet, which is considered sufficient for six men. I need hardly occupy space with details about the exceeding unhealthfulness of such extreme crowding. The simple shelter tent, used for protection on active campaigns, would be preferable for a permanent camp, notwithstanding the exposure incident to their employment.

A serious hygienical evil, arising from the lack of space and the close contact of men in winter camps, is the little attention paid to the personal cleanliness of the men. Their clothing is never removed; their blankets become saturated with organic emanations; and their skin becomes loaded with cast-off epidermis, sebaceous matter and dirt. Huts should be erected, or tents pitched, and arranged as lavatories. Close, daily inspections of the persons of

the men should be made, to insure attention to the very important matter of personal cleanliness, and stringent regulations with regard to bathing be enforced.

The hut or tent, immediately after reveille, should be thrown open to the external air; the blankets should be exposed to the sunlight; the floor and walls should be swept, for which purpose a bundle of twigs makes an excellent broom. Every week the flooring should be removed and the ground cleaned; if there be no flooring, the sand should be frequently renewed. If lime can be procured, both the exterior and interior of the hut should be whitened once a month. Occasional fumigations with sulphurous acid, nitrous acid or chlorine, should constitute a part of the hygienic means, and if these agents cannot be procured, wood smoke may be used, which is more or less effective as a disinfectant, because of the pyroligneous and carbolic acids which it contains. Tents should be subjected to the same general treatment. In addition, they may be frequently moved upon fresh ground. Straw should not be used unless a sufficient quantity be procurable to permit it to be changed once a week, and if used, it should not cover foul earth or other nuisances. The ground about the hut or tent quickly becomes saturated with urine, slops or kitchen offal, if the strictest supervision is not maintained by sanitary officers. The men will, despite of every precaution, urinate about their quarters at Tattoo and Reveille. It becomes necessary, therefore, to remove the surface occasionally, and apply fresh earth or sand. The ditches and sewers for draining the camp should be carefully constructed, and made to empty at a point remote from the sources of water-supply. The slops from the kitchens and the surplus water from the lavatories should be conveyed at once to the sewers, and should not be thrown upon the ground under any circumstances. To prevent the sewerage soaking into the ground, the drains should be lined with smooth, flat stones, tiles, or with roughly hewn logs of wood.

One of the first and most important considerations to engage attention in establishing a camp, is to arrange suitable latrines sufficiently near to be readily accessible, and yet remote enough to prevent contamination of the air by the privy gases. They should be placed to the leeward of prevailing winds, and under cover of an eminence, if the nature of the ground will permit. For winter camps, or temporary camps during active operations in the field, but one kind of latrine can be constructed—the pit. This,

however, may be so arranged as to be but little objectionable. It should be deep rather than wide; a substantial leg frame should be placed around it to support the seats; two rows of comfortable seats should be provided for each pit, and the seats should be separated by a partition or screen; the whole arrangement should be inclosed by a covered stockade. Every morning a layer of fresh earth and charcoal should be thrown over the ordure to the depth of three inches. Freshly-burned charcoal should be used for this purpose; it can always be prepared in the neighborhood of the camp by burning under earth the boughs of the trees used for fire-wood. The ashes from the kitchens and camp-fires is, also, a most useful material for the deodorization and disinfection of latrines. Beside these means, the commissariat should be supplied with the sulphate of iron and impure carbolic acid for the more permanent disinfection of foul pools, more especially if specific products are known to be present.

As a large part of the meat ration furnished an army is in the form of animals "on the hoof," the necessary butchering shambles may be so conducted as to contaminate the air and the water supply. The utmost cleanliness, hence, should be observed in these places; the slops and blood being made to discharge into the stream or river below the camp, and the intestines and refuse being burned or buried.

Unless special and enlightened care is exercised, the camp ground becomes the receptacle of every conceivable kind of filth. A daily system of police work, carried on by a large number of men under competent direction, is absolutely necessary to preserve a cleanly condition of the camp. As ordinarily performed police work is spasmodic, irregular, and especially deficient in that necessary element—knowledge of the laws and requirements of hygiene. Every army should be provided with its sanitary officer skilled in the theory and practice of hygiene, whose exclusive office it should be to ascertain the causes of disease, and to indicate the means of prevention necessary. His subordinates, possessed of similar qualifications, should have a place in the organization of corps, divisions and brigades. It has been sought to accomplish this object by investing the medical department of the army with advisory powers based upon knowledge gained in inspections, but a mere advisory power is of little value. If details of men were furnished, and the execution of the sanitary work intrusted to medical officers, then their special knowledge of health affairs would produce

tangible results. A sanitary police, commanded by line officers and working under the direction of the senior medical officer of the army, corps, division or brigade, would fulfill all the requirements of the case.

Malaria.—One of the most important causes of disease, at least in many countries, against which sanitary measures must be directed, is that specific morbific cause—malaria. This is an influential element in that tripartite morbid state to which reference has already been made. The influence of this cause is shown in the statistics of the first two years of the late war:

Cases of malarial disease,.....	486,570
Deaths therefrom,.....	3,823

The British army in the Crimea suffered to a very limited extent from malarial poisoning; the French army much more severely, but we have no satisfactory statistics in relation to the prevalence of paludal diseases in the latter. In the late Prussian campaign malaria does not appear to have been a cause of disease, for the mortality was due, chiefly, to cholera and typhus (typhoid).

The effects of the sudden impression of large quantities of malaria upon the organism, producing febrile phenomena, are to be distinguished from the chronic malarial poisoning—a state in which certain changes have been slowly induced in organs without the occurrence of fever. These changes consist in a thickening of the solitary glands of the intestinal canal, pigment deposits in the mouths of Lieberkuhn's follicles, an enlarged and fleshy state of the spleen, and a fawn color of the liver, and are characterized objectively, by a peculiar bronzing of the integument, leanness, and more or less diarrhœa. In these cases, periodical fever is not apt to occur unless some traumatic injury or change in climate make some unusual impression on the organism. The alterations described in the glandular apparatus of the intestinal canal constituted the basis of some of the most intractable cases of camp diarrhœa, and the subjects of them were exceedingly liable to grave intercurrent diseases. The importance of this state of chronic malarial poisoning can hardly be over-estimated, for it involved not only the immediate changes I have described, but such serious secondary affections as camp diarrhœa, intercurrent pneumonia, pleuritis, ascites, etc. It is, therefore, a hygienic question of great importance, to determine by what methods the effects of malaria may be lessened or prevented. The chief causes which aid the

action of malaria are excessive fatigue, night duty, insufficient and improper food, camping in unwholesome situations, *ennui*, etc.

Healthy and vigorous men, having good habits of body, and cheerful of mind, and officers who enjoyed more nutritious diet and other comforts, were not nearly so subject to malarial poisoning.

It is evident that many of the causes which aid the action of malaria are inseparable from the conditions of military life, and hence, can be obviated but in part by hygienic measures. Operations of armies in malarious regions may be so managed as to lessen the dangers of malarial poisoning. Long marches may be so conducted as to render the fatigue and exhaustion less complete; night duty may be so arranged as to relieve it of much of its needless exposure; a suitable dietary may be provided, and a wise foresight insure a regular and uniform supply; the camp may, generally, be selected with a careful reference to the requirements of hygiene; in camp, systematic gymnastic exercises, games, and other employments, may take the place of the horrid tedium and *ennui* which so assail the soldier without occupation.

Instead of these wise hygienic measures, which would diminish, if not prevent, the effects of malaria, and would also benefit the sanitary condition in other respects, attention has rather been directed to the use of medicinal prophylactics. During the late war, the prophylactic virtue of quinia was tested on a large scale. Although the evidence of its power in this respect is conclusive, yet the facts warrant me in saying, that no measure of medicinal prophylaxy is equal to, or can be substituted for, those measures of hygiene just indicated as necessary. Quinine loses its power by long continued use. Its anti-periodic power is not exhibited satisfactorily in cases of chronic malarial poisoning, and hence, its prophylactic power is feeble in the same morbid state. As a result of considerable observation on this point, I venture to propose the following rules regarding the use of quinine as a prophylactic:

It should be reserved for occasions of exposure to malaria of unusual amount and intensity.

It should be administered alone and with great regularity.

Five grains daily is the minimum allowance.

As a common and ordinary means of protection from malarial poisoning in addition to those hygienic precautions I have named, the liberal use of hot coffee is of the greatest value. Soldiers on guard, and troops on outpost or picket duty, in malarial regions, should be furnished with an abundant supply of black coffee, to be

taken freely during night service and in the early morning. So, also, all military commands serving in malarial regions should be provided by the commissariat with sufficient coffee to permit its use under all circumstances of unusual fatigue, exposure or climatic changes.

Scorbutus.—Defective alimentation enters largely into the production of scorbutus, but a variety of causes retard or prevent its action. Troops on a meager diet, in permanent camps situated in unhealthy localities, closely confined in dark, ill-ventilated huts and suffering from *ennui*, are much more liable to that peculiar form of degeneration of fluids and solids known as the "scorbutic taint," than troops on the same insufficient diet, actively engaged in military operations and stimulated to new exertions by past successes. This statement is well exhibited in the returns of the sickness and mortality of the British army, for the six months from October '54 to April '55, and for the last six months, of the occupation of the Crimea:

Average strength,	28,623
Cases of scorbutic diseases for one month, January, 1855,	1,761
Deaths from scorbutic diseases during same period,	2,252
Ratio of cases of scorbutic diseases per 1,000 of mean strength,	276
Ratio of deaths from scorbutic diseases per 1,000 of cases,	254

Sir A. Tulloch computes the losses from all forms of diseases for six months (Oct. '54 to April '55) at the rate of 600 per annum per 1,000 of mean strength—almost one-half being, as the above figures show, from scorbutic diseases. In the last six months, however, we find that the mortality rate was reduced to 11.5 per 1,000 of mean strength. We have, in these figures, the result of an improved hygiene—habitation, diet, drainage, etc.—and the important successes which led to the conclusion of the war.

If we compare these statistics of scorbutic diseases in the British army in the Crimea, with the returns of scurvy for the first two years of the rebellion, we observe a remarkable difference:

Ratio of scorbutic diseases per 1,000 of mean strength for the month of Jan., 1855,	276
Mean annual ratio of scurvy in Union Army for 1862-3 per 1,000,	9

These figures, taken as they stand, without explanation, would justify the enthusiastic comments of Dr. Woodward (*Circular No. 6, p.* 134). "This extremely small number of cases of scurvy is unparalleled in the history of armies." Closer analogies will re-

veal how little justification there was, really, for this outburst of enthusiasm. If we take the figures for scurvy alone, as given in the returns for the Crimean war, we find, that during the worst period (month of Jan., 1855) there occurred 342 cases, being at the rate of 18 per 1,000 of mean strength; if, however, we include the year, the ratio is much reduced.

Under the term, scorbutic diseases, for the month of January, 1855, are included dysentery, diarrhœa, rheumatism, frost-bite and scurvy. If we include the same forms of diseases occurring in the Union army under the same designation, the figures would approximate closely to those of the six months (Oct., 1854, to April, 1855)—the fatal period in the experiences of the British army in the Crimea.

As defective alimentation is the principal cause of scorbutus, great efforts have been made in modern times to arrange a proper dietary for troops. The problem to be solved may be expressed as follows: the necessary components of the ratio being known, in what form can these be furnished to troops? Certain nitrogenous (albumen, fibrin, casein, legumin, gluten, &c.) and fatty substances (animal and vegetable oils), carbo-hydrates (starch, sugar and gum) and salts (potash, soda, lime, iron, phosphorus, chlorine, &c.), are necessary constituents of a ration for troops. They must be afforded in such a state as to resist the action of climate and time.

I have already made a study of the U. S. army ration as applied to the nutrition of recruits, and have shown in what respects it may be amended. The changes suggested involved chiefly the vegetable part of the ration, but as the additions proposed included very destructible and not very portable articles, such alterations would not be suited to the requirements of field service. To ascertain what form of food is best suited to the conditions of the soldier's life, we must first fix the number of ounces, daily allowance, of the several constituents necessary to preserve him in a good sanitary state. The minimum gross allowance may be placed at 40 ounces and the maximum at 60 ounces. The ration of the British army in the Crimea was as follows:

	Lbs.	Oz.		Lbs.	Oz.
Bread, or	1.	8	Sugar	0.	2
Bread	1.		Coffee, or	0.	1
Meat,	1.		Tea	0.	½
Rice	0.	2	Lime juice	0.	1

¼ gill of Rum
½ oz. Salt,
½ oz. Pepper, } for every 8 men.

This made an aggregate of about 46 ounces gross solid nutriment. The French army ration in the Crimea consisted of—

	Lbs.	Oz.	Dr.		Lbs.	Oz.	Dr.
Bread and biscuit,	1.	15		Salt,	0.	0.	9
Biscuit,	1.	7.	6¾	Coffee,	0	0	9
Fresh beef,	0.	10.	9½	Sugar,	0	0.	11¾
Salt pork,	0.	8.	7½	Wine, 1¼ of a gill.			
Rice or Beans,	0.	2.	1¾	or Brandy, ⅞ of a gill.			

which makes an aggregate of about 44 ounces in the gross. The peace ration of the U. S. army was about the same as that of the English and French armies in the Crimea, but during the rebellion it was so much increased as to contain at least 8 ounces more than that previously allowed. This fact may explain in part the less amount of the scorbutic element in the diseases of the Union army during the late war, than existed in the British army during a part of the service in the Crimea, but there were other important influences at work, as will appear in the further consideration of this subject.

As the 40 or 60 ounces of solid food contain a certain quantity of water and loss, the amount available for the nutrition of the body is not more than 30 per cent. This nutrient material should consist of the following:

Nitrogenous substances (albuminates),..... 3 oz.
Fats, ... 3 oz.
Carbo-hydrates (starch, sugar, &c.), ...11 oz.

These quantities and articles, however suitable theoretically, do not embody all that is found to be necessary for maintaining the health of troops. Practical experience has shown that something more is requisite than a mere supply to the soldier of the necessary constituents as shown by ultimate and proximate analysis to be necessary, and which may be provided in small bulk and in an unchangeable form. It is necessary that there be a certain variety even of foods possessing the same components, and that the ingesta have sufficient volume. Variety in form and in taste has not been sufficiently regarded in making up diet tables for troops.

Une bonne alimentation consiste dans la variété et la bonne qualité des denrées plus encore que dans leur quantité.—(Instruction du Conseil de santé des armées.)

The essential elements of food contained in fresh beef do not exist in so available a form in any other article. Hence, that is a most judicious regulation of the U. S. army which permits the use

of fresh beef as many days in the week as the commanding officer may direct. Under the conditions of military experience, as seen on this continent, salt meat need rarely be issued to troops more frequently than twice a week, for beef cattle can usually follow the march of an army with little difficulty. As variety in the diet is essential, sufficient salt meat should be allowed for two days in each week. Variety we hold to be necessary even at the expense of the loss of some nutritive material. Salt meat, according to Liebig, loses from 30 to 50 per cent. of its nutritive value in the process of curing. This loss has been practically demonstrated by Mr. Whitelaw (Chemical News, March, 1864), who has shown, that by the process of dialysis, extract of meat may be obtained from brine, and he proposes to utilize this discovery by mixing the extract thus obtained with flour to form meat biscuit. We have, in these facts, an explanation of the production of scorbutus by the use of salted foods; the result is due not so much to the excess of salt as to the deficient nutritive value of meat cured by this process—the deficiency not being made up by the addition of corresponding vegetable constituents.

For quick movements, the troops carrying their own rations, it may be impracticable to convey fresh beef "on the hoof," and hence bacon is the best substitute, both by reason of compactness and adaptation to the tastes of the soldier. The meat biscuits and the condensed essences which have been proposed from time to time, although sufficiently portable and nutritious, are not palatable and hence cannot be substituted for bacon. As has been remarked, troops engaged in active field movements, are more healthy than those remaining in permanent or winter camps, notwithstanding they have a less nutritious diet. The bad hygiene of the camp, lack of mental and physical employment, the horrible ennui, are more to be dreaded than the imperfect diet and exposure of the field.

If we would derive the greatest amount of nutritious value from the material, it is important that correct hygienic principles govern the cooking of the beef. Generally speaking, for military purposes, but two methods are proper: boiling and stewing. Unfortunately, on account of the convenience of the operation, frying is the method of cooking beef most popular with the soldiers. The processes of boiling and stewing involve certain principles of so important character, that they should be carefully instilled into the minds of the cooks in course of training at the primary depot. Beef is boiled

with either of two objects, in view: to make soup, or to serve as boiled beef. The process will be different in each case. In the preparation of soup the beef should be put into cold water and the temperature be slowly raised and maintained at 150° F.—a degree of heat which should not be exceeded. When the meat is to be served as boiled meat, it is of course desirable to retain as much of the salts and extractive matters as possible; to accomplish this, the meat in large pieces, should be plunged for five minutes into boiling water to coagulate the albumen of the exterior; after this it should be cooked in water at a temperature of 180° F.

In the process of stewing—as in the preparation of soup—it is essential that the heat be not too great, and that the cooking proceed slowly. Vegetables and condiments may be added to increase the sapid and nutritive qualities.

Next in importance to the animal part of the ration, is the vegetable, consisting chiefly of flour (wheat and corn), rice, beans, potatoes, etc. Flour is the chief in respect to nutritive value and adaptation to the taste. Troops in permanent camps are supplied with flour, and on the march with hard bread. Not unfrequently, flour is issued in bulk to the companies, and then distributed to the men who bake it, or, as often happens, fry it in bacon fat after a method peculiarly military. Serious evils result from this system. Much of the nutritive material is lost in the process of cooking it, and an indigestible mass remains, which produces intestinal disorders. Hard bread (biscuit) has the advantage of portability and freedom from change, but it quickly palls on the appetite and deranges digestion. The long continued use of it, during the rebellion, was unquestionably a cause of camp diarrhœa and of the scorbutic cachexia, but this cause had not by any means the degree of importance assigned to it by Dr. Salisbury of Ohio, who in a report to the Surgeon General of that State, ascribed the production of camp diarrhœa, chiefly to the use of hard bread. Under ordinary circumstances, no necessity exists for the prolonged use of hard bread. Fermented bread can be prepared and issued by the commissariat at all permanent camps, and generally, during the most active movements of an army in the field. Portable ovens have been constructed and successfully used. There appears no reason why these cannot follow the movements of an army, as readily as the forges which the military authorities find it necessary to transport. More or less difficulty is usually experienced in preparing fermented bread in the field, owing to the various hindrances to

the process of fermentation. Field bakeries—portable ovens—should be provided with Prof. Horsford's baking powder, which consists, as is well known, of phosphoric acid, acid phosphate of lime and bi-carbonate of soda. This, mixed with the flour, furnishes carbonic acid for giving lightness and other peculiar qualities to the dough, and also, notable quantities of phosphates of soda and lime, salts having important relations to the nutrition of the body.

In the use of bread, the importance of change and variety should not be overlooked. Kiln-dried corn meal should constitute a part of the flour ration. As the corn is richer in fatty matter than the wheat, the diet would be improved not only in respect to variety, but also to quality.

The remaining components of the soldier's food, chiefly rice and beans, contain a large quantity of starch. Beans are theoretically desirable because they have about 20 per cent. of a nitrogenous substance, called legumin, combined with sulphur and phosphorus. About one-half of the nutritive material of the diet of soldiers, consists of starch. This quantity is in excess of the requirements of the organism, and is therefore an evil. The strong tendency to disease of the glandular apparatus of the small intestines which exists among troops in the field, especially when serving in malarious regions, renders the use of so much starchy food prejudicial, for the physiological reason, that the digestion of this part of our food is accomplished by the secretion of these glands, (intestinal juice). Rice contains 79 per cent. of starch and beans 50 per cent. For this reason beans are to be preferred to rice; but serious objections exist to the former, in that they are difficult to prepare properly, indigestible in consequence of the insoluble nature of their contained starch, and provocative of intestinal disorders because of the quantity of residual matters. I have seen such strong evidences of injury from the use of beans, that I have no hesitation in declaring them unsuited to troops on active campaigns. If on account of the portability and unchangeableness of rice and beans they must enter into the composition of a ration for troops, they should at least be reduced in amount. They should be retained in smaller quantities, to give that variety to the diet, which is so essential to the taste and to the proper performance of digestion. The potato should form a part of the ration for soldiers. This vegetable contains, in addition to an easily digested starch, certain vegetable acids of great value in the prevention of scorbutus. According to

the U. S. Army Regulations, "one pound of potatoes per man shall be issued at least three times per week if practicable." This is an excellent regulation, and generally quite practicable, but the allowance is too small; one pound daily ought to be issued, for the potato contains about 75 per cent. of water.

It is not always possible to procure and transport in its natural form, the vegetable food indicated above. Our hygienic appliances must be arranged to compass these contingencies of wars and military campaigns. Fortunately the progress of modern art, has put us in possession of means of so condensing food as to render its preservation and transport comparatively easy. Mixed vegetables, consisting of potatoes, turnips, carrots, peas, cabbage, etc., are prepared by desiccation to resist the action of climatic changes and so compressed that a large amount of nutritive material is contained within a comparatively small compass. Desiccated potatoes are prepared in the same way. The points to be attended to in cooking these desiccated vegetables, are these: they should be soaked in cold water several hours and then be slowly boiled or steamed. Eaten simply boiled, they are not palatable, but as constituents of a soup or stew, they are most excellent. During the rebellion, strong prejudices existed against these articles, for the reason that improper modes of cooking rendered them unpalatable, and hence they were not used as freely as they should have been. Conclusive testimony has been published (*Medical Statistics U. S. Army*, 1859), as to the antiscorbutic value of the desiccated vegetables. During the Utah campaign they were the only vegetables issued to the command, except flour, rice and beans. The daily allowance of flour at the same time, was only 12 ounces and the other components of the rations were correspondingly reduced, yet but six cases of scorbutus occurred in a command, the mean strength of which, was 2,500. Desiccated vegetables cannot of course take the place of fresh vegetables, but in the case of absence or deficiency of the latter, they are very desirable substitutes or adjuncts.

As respects beverages, coffee and tea take the first rank; they are indispensible to the soldier. They lessen waste of tissue, diminish the effects of cold, heat and fatigue, and are protective against malaria. I have already indicated the circumstances requiring the free use of these beverages as hygienic agents. The evidence is conclusive that alcoholic drinks are, under no circumstances, necessary or proper for troops. They are not antidotal to malaria;

they rather dispose to, than prevent scorbutus. I have had an opportunity of observing the latter fact in the most unquestionable manner. Serving with a body of troops under circumstances when it was possible to know the habits of each individual, and the conditions being favorable to the production of scorbutus, the only victims to that disease were old drunkards. Although the whisky ration was long abolished in the army, it is still issued under circumstances of great fatigue, or combined with quinine in the case of service in malarious regions. The hygienical notions governing the use of spirits under these circumstances, are erroneous. The truth is well expressed in the following language of the distinguished Professor of Hygiene at Netley. (*Manual of Hygiene*, 2nd ed. p. 236). "Looking back to this evidence, it may be asked, are there any circumstances of the soldiers' life in which the issue of spirits is advisable, and if the question at any time lies between the issue of spirits and total abstinence, which is the best? To me there seems but one answer. If spirits give neither strength to the body, nor sustain it against disease—are not protective against cold and wet, and aggravate, rather than mitigate the effects of heat—if their use, even in moderation, increases crime, injures discipline and impairs hope and cheerfulness—if the severest trials of war have been not merely borne, but most easily borne without them, if there is no evidence that they are protective against malaria or other diseases—then I conceive the medical officer will not be justified in sanctioning their use under any circumstances."

Beside those articles, which have been found by experience to be indispensible to the health of troops, a variety of other substances, so-called antiscorbutics, have been issued with great advantage. Owing to the timely use of these, to the improvements in the permanent ration of the soldier, and to the substitution of coffee and tea for the whisky ration, that dreadful scourge of armies, scorbutus, has been much less prevalent in armies engaged in recent wars. The improvement in respect to this disease, was most marked in the second year of the Crimean campaign; during our late war, scorbutus was less prevalent than in the British army, the first year in the Crimea, and the evidences of this disease were almost nil, in the late campaign of the Prussians. The efforts of hygienists should not be abated, until scorbutus entirely disappears. To accomplish this desirable result, the use of antiscorbutics must not be postponed, as is too frequently the case, until the scorbutic cachexia begins to manifest its baneful effects.

This was the error committed during the late war of the rebellion, and hence notwithstanding the comparative success of our measures, scorbutus disfigured the returns of sick. For the first year of the war, 1,328 cases of scorbutus and 9 deaths were reported, and for the second, 7,366 cases and 99 deaths. According to Dr. Woodward, (*Circular No. 6,*) "a scorbutic taint, more or less pronounced, was a prominent phenomenon in most of the diseases of the war." The use of antiscorbutics, (vinegar, sauerkraut, pickled cucumbers, onions, cabbages and beans, dried apples, molasses, etc.,) was postponed until evidences of the scorbutic taint were present. This mischievous error caused vast misery, and impaired the efficiency of the military forces.

For the prevention of scorbutus, three things are requisite: food having the essential components; variety in the articles, and careful cooking. It will little avail to possess the first two, and be deficient in the latter. Competent cooks will effect much, with even limited materials; incompetent cooks will destroy the nutritive value of the best articles; hence the importance of carefully training a corps of cooks at the primary depots. To insure uniform results in all the culinary processes, specific rules should be made and published, governing the administration of the kitchens and the preparation of camp and field diets. Ignorance of the first principles of the culinary art, is the prevailing error; this may be corrected by instruction at the primary depots, and by the education of line and staff officers in the various departments of hygiene. The most carefully trained cooks will become negligent in the performance of their duties, if not governed by specific regulations and supervised by those competent to detect, and having the power to punish delinquencies.

It may be instructive to note the degree in which these morbific causes impair the efficiency of armies, and to ascertain what measures of hygiene have been most effective in preventing their action. The principal diseases which occur in armies, are the results of the combined action of crowd-poisoning, scorbutus and malaria. Thus, typhoid fever, which as M. Levy has well said, "is the pathological expression of confined air upon soldiers," is modified by scorbutus and malaria, and diarrhœal diseases, if not directly produced by crowding, scorbutus and malaria, are at least greatly increased in severity by the combined action of these several causes.

Fevers, probably, hold the first rank in point of importance. Comparing the mortality from typhoid fever in the British army in

the Crimea, with the U. S. Army during the rebellion, we have the following result.

No. of cases of Fever in British Army,	39,316
No. deaths,	3,561
Percentage of deaths to cases,	10.4
Number of cases of Fever (Typhoid and Typho-malarial) for two years in U. S. Army	33,124
Number of deaths for the same period,	17,376
Percentage of deaths to cases,	52.6

It thus appears that the mortality from fever in our army was more than twice as great as in the British army in the Crimea. I find on examination, indeed, that the mortality from fever was greater in our army than it was at the worst period (March, 1855) of the prevalence of this disease in the British army. The figures are as follows:

Percentage of deaths to cases of Fever in British Army for March, 1855.	31
Percentage of deaths to cases of fever in U. S. Army for first two years of war.	52·6

Comparison of the death rate from fever with the deaths from all causes, will be instructive.

Deaths from fever in U. S. Army per 1,000 of deaths from all diseases.	316.
Deaths from fever in British Army in the Crimea per 1,000 of deaths from all diseases.	135

M. Levy furnishes us with the following statistics of the mortality from fever in the French Army for three years.

Typhoid Fever.	1863	196 deaths per 1,000 in general.
	1864	177 " " " "
	1865	160 " " " "

This table exhibits two facts: the close correspondence of the mortality rates of fever in the French and English armies; and the evidence of the influence of improved hygiene in gradually diminishing the proportionate mortality.

If we compare the mortality from diarrhœal diseases, the facts are in favor of the U. S. army.

Percentage of deaths from diarrhœa and dysentery in British army in the Crimea,	11·26
Percentage of deaths from diarrhœa and dysentery in the U. S. army (mean of two years).	4·1

In estimating the mortality rate of diarrhœa and dysentery in U. S. Army, I have excluded the statistics of acute diarrhœa—a disease of very insignificant character, and usually feigned by those who wished to procure a temporary respite from duty. It is to be remembered, further, that a cholera influence or predisposition, increased the severity of the type of the diarrhœal maladies prevalent in the Crimea.

There are certain contagious and epidemic diseases affecting the health of armies, which require special means of prevention. An excellent hygienic condition, will diminish the liability to the occurrence of these epidemics and limit their effects, but will not entirely prevent them. The most complete isolation in special hospitals is absolutely necessary for the prevention of eruptive fevers. Regiments or bodies of troops in which these fevers occur, should not be permitted to join armies until the period of incubation has passed. The importance of this measure is exemplified in the returns of sickness and death from measles, the second year of the war.

Cases of Measles,	16,345
Deaths,	1,312
Ratio of deaths to cases, 80 per 1,000.	

The death rate as expressed in these figures does not represent the real mortality, as has been stated by Dr. Woodward, for the measles destroyed vast numbers. This disease, unquestionably had its origin in contagion, but was increased in severity, by the bad hygiene of the primary depots and of the permanent camps.

Of small pox and varicloid, 4,172 cases and 1,544 deaths occurred during the first two years of the rebellion.

Ratio of deaths per 1,000 cases of small pox,	373
Ratio of deaths from small pox, per 1,000 deaths from all diseases,	37·4

These statistics may be compared with those of the French army for the same disease. Before the year 1839, according to M. Levy, the figures were as follows:

Ratio of deaths from variola and varicloid, per 1,000 of deaths from all causes,	39.

After new instructions by the Minister of War, requiring general revaccination, the proportion of deaths fell to

11·6 per 1,000 of deaths from all causes.

"During the triennial period from 1843 to 1845," says M. Levy, "of 311,000 patients in the military hospitals, there were 4,207

cases of variolous disease=135 per 1,000 sick," being twelve times more than occurred in U. S. army the second year of the late war. Yet we find the mortality in the French army was only 132 deaths per 1,000 cases—a mortality but one-third of that from the same disease in U. S. Army.

The reduction in the death rate from variola and varioloid, in the French army, from 1859 to 1865, is a signal exemplification of the power and utility of vaccination, and is attributed by Levy, to the ministerial instruction which required that "all recruits upon arriving at their corps will be vaccinated, whether or not they present traces of vaccinia."

Against the zymotic diseases in general, are the measures of military hygiene, to be chiefly directed. All of them are amenable to the same means of prevention: avoidance of crowding, suitable camp sites, drainage, ventilation, cleanliness, sufficient aliment properly prepared, well regulated exercise. The sanitary history of the British army in the Crimea furnishes, as I have shown, the most striking evidence of the great value of these measures. In the words of Miss Nightingale, in her testimony before the English Sanitary Commission—"It is a complete example—history does not afford its equal—of an army after great disaster arising from neglects, having been brought into the highest state of health and efficiency. It is the whole experiment on a colossal scale. In all other examples, the last step has been wanting to complete the solution of the problem."

"We had in the first seven months of the Crimean campaign, a mortality among the troops, of 60 per cent. per annum alone—a rate of mortality which exceeds that of the great plague in the population of London, and a higher ratio than is the mortality in cholera to the attacks; that is to say, that there died out of the army in the Crimea, an annual rate greater than ordinarily die in time of pestilence, out of sick."

"We had, during the last six months of the war, a mortality among our *sick*, not much more than that among our *healthy* guards at home, and a mortality among our troops in the last five months, two-thirds only of what it is among our troops at home."

It is a fact recognized by all who have served with troops, that active movements, marches and field operations, are favorable to the health of troops, and prolonged stay in camps prejudicial. On marches, the influences comprised under the term crowd-poisoning, have not time to be developed, but a few days or weeks of sejours

in camps, suffice to create them. Besides these evils, there are others of a moral character, which no less require the interposition of hygienic measures. The idleness and the monotonous duties of the camp, weary the men, and they lapse into a state of *ennui* and despondency, which lowers the general health and promotes the action of morbific causes. Having nothing else to do, the men lounge in their tents or huts, smoke incessantly if they can procure the tobacco, or doze during the long hours of the day, to be wakeful at night. They thus breath impure air of their quarters much more than is necessary. The French understand these evils and have thoughtfully instituted means to prevent them—games, gymnastics, out-door sports, which are carefully regulated by official decrees.—(*Didiot, Code des Officiers de Santé, Deux. part*, p. 710). *Rien n'est plus salutaire à la santé que l'action, le mouvement; et toutes choses égales, d'ailleurs, la santé du soldat se maintient mieux dans les camps qu'en garnison*, is the motto with which Didiot heads his chapter on military exercises and movements, (gymnastics).

The chief sanitary evils of active campaigns, is the camping in unhealthy situations, e. g. in malarious districts and on ground previously occupied by troops. Camps should never be placed on low grounds, near marshes, upon badly drained soil or subsoil, or at the head of ravines leading up from low malarious valleys. As contagious diseases, cholera, dysentery, camp fever, etc., are produced by camping on ground previously occupied and saturated with organic emanations; such positions should be avoided. The military necessity, when in the presence of an enemy, may require the violation of these rules of hygiene, but the necessity ought to be clear and unequivocal.

The "route step" has been wisely substituted for the close order which military martinets formerly required. This step gives greater freedom of motion, permits the carrying the "arms at will." The greater space between the files, prevents the continual rebreathing of the exhalations from each other's lungs. Frequent halts are necessary to permit the men to drink and refresh themselves. When marching in the rain, the men should be protected by their ponchos, and should be provided with a gum blanket to lie on at night. Nothing is more grateful to men on the march, or more beneficial hygienically, than a plentiful supply of infusion of coffee or tea. They should be encouraged to drink this, rather than the selenite or calcareous waters, or those containing organic matter, or the clear marsh water of malarious districts.

The character of the clothing is not without influence upon the health of soldiers. The material of the clothing should be woollen —for this is best fitted to prevent the injurious influences of great and sudden variations of temperature. That issued to the U. S. troops is, when properly made, unexceptionable, hygienically considered. It is so well known that I need not enter into any details respecting it.

It is one thing to propose measures for promoting the hygienic conditions of armies, and quite another, to secure a faithful execution of them. Military officers should be trained in all the methods of hygiene. Unfortunately, the suggestions of medical officers are generally coldly received, if not absolutely ignored. Military commanders are impatient of interference, and are especially intolerant of all measures, such as hygienic improvements, which seem to reflect on their wisdom. A distinguished general of the late war, praised without stint the medical director of his army, and the ground of his favorable opinion, was frankly admitted to be "the Doctor never troubled me." A parallel existed in the medical service of the British army—for, according to Miss Nightingale, a medical officer abstained from making suggestions, lest he should get the reputation in the service of being a "troublesome fellow."

A general will rarely receive suggestions or recommendations from his chief medical officer, unless the matter be embraced within the specific duty of the medical officer as defined in orders and regulations. As the manifold questions of hygiene involve the various details of military command and authority, they cannot be decided on by advising and inspecting officers. Moreover, the general in command, in the field, may suspend almost any authority which conflicts with his appreciation of the military necessity. If the commanding officer does not know that men require a certain air-space in order to be healthy, and that crowding will produce disease, he will not be inclined to act upon the information of a medical officer. In order, therefore, to give effectiveness to hygienic measures, it is necessary that officers of the line who command troops, be instructed in hygiene. If the study of this science were made a part of the curriculum at military schools, the good effects would soon be observed in an improvement of the hygienic condition of armies.

A corps of sanitary inspectors and a systematic plan of inspection, are valuable means of ascertaining the existence of sanitary evils. As organized and conducted during the late war, the san-

itary corps had but little effectiveness. The inspectors reported to their chief at Washington, and not to the chief medical officer of the army, or department in which they were inspecting. There was a lack of coördination in this arrangement, which prevented harmonious working, and destroyed all unity of purpose and effort. An army medical inspector should be inferior in rank to the chief medical officer, and should be required to report directly to the latter. The qualifications for appointment to the post of medical inspector should consist in an extended acquaintance with the science of hygiene, and of the adaptation of hygienic measures to the exigencies of military service.

Summary.—By what hygienic means may the health of armies be best preserved?

The conclusions to which I have arrived after a careful survey of the whole ground, are expressed in the following summary:

1. The minimum age of the men composing an army, should be twenty-five. In addition to the ordinary requirements of recruiting regulations, the influence of diatheses and cachexias over the health and physical stamina should be considered.

2. In the training of recruits, the conditions of the military service should approach as nearly as possible, to those of civil life. As the mortality of this period is greatly in excess of the other periods of military life, special hygienic precautions should be taken as respects habitations, diet, clothing, exercise, amusements, etc.

3. As the chief danger to the health of the soldier arises from crowd-poisoning, scorbutus, malaria, a morbific cause compounded of these, and from contagious and epidemic diseases, the sanitary regulations of armies should be especially directed to the avoidance of the evils of permanent camps and barracks; to providing a varied and ample diet; to instituting the most approved measures of private and public hygiene, and to enforcing police laws against the spread of probable zymotic diseases.

The question proposed by the Committee as to the comparative hygienic condition of the Union army during the late war, and of the armies in the great campaigns of Europe, must be answered as follows:

The statistics prove that an unusual degree of health did not prevail in the U. S. army during the war.

Compared with the first year of service of the British army in the Crimea, the health of the U. S. army was better, and the mortality rates lower; but

Compared with the last six months of the British army in the Crimea the health of the U. S. army was much worse, and the mortality rates much higher.

The sanitary condition of the Union army during the late war was not any better than that of the French army in the Crimea, and was not so good as that of the French army in Italy and Algeria.

The sickness and mortality rates of the Union army during the late war, were very much higher than those of the Prussian army in the late campaign against Austria.

The diminution of the sickness and mortality rates of the European armies during the last twenty-five years, the result of improvement in hygiene, have not occurred in the same ratio in the U. S. army.

ARTICLE IV

QUININE AND ITS SALTS.

RUSSELL PRIZE ESSAY

ON

THE THERAPEUTIC USES AND ABUSES OF QUININE AND ITS SALTS.

Quod semper ubi

BY

ROBERTS BARTHOLOW, A.M., M.D.,

PROFESSOR OF MATERIA MEDICA AND THERAPEUTICS IN THE MEDICAL COLLEGE OF OHIO; FORMERLY ARMY SURGEON (CAPTAIN) U. S. ARMY, ETC.

Materia Medica, a collection of incoherent opinions, is perhaps, of all the physiological sciences, that which most exhibits the contradictions of the human mind. In fact, it is not a science for a methodic spirit; it is a shapeless mass of inexact ideas, of observations often puerile, of imaginary remedies, strangely conceived and fastidiously arranged.—*Bichat, Anat. Générale.*

The merit of a therapeutic treatise does not consist so much in the nomenclature and classification of curative agents, as in a scrupulous care to specify well the circumstances which cause a variation in the effect of these agents; not in attributing to them any imaginary virtue in connection with this or that medical doctrine, but in keeping strictly to the results of pure observation.—*Renouard's History of Medicine.*

The salts of quinine employed in medical practice are the following:

Quinia.			
Compounds with Vegetable Acids.		Compounds with Mineral Acids.	
Kinate.	Acetate.	Phosphate.	Hydrochlorate.
Tannate.	Tartrate.	Sulphate.	Arseniate.
Citrate.	Valerianate.	Nitrate.	Ferrocyanate.

As the sulphate is the salt almost exclusively used, wherever the term, quinine, is employed in these pages without explanation, the sulphate is meant.

In pursuing an inquiry into the therapeutic uses and abuses of quinine and its salts, two objects should be held in view:

To ascertain the real value of these agents in the diseases for which they are now prescribed;

To add to the sum of existing knowledge by original investigations.

The inexact notions now prevalent regarding the uses of quinine are exhibited in the immense variety of indications which it is supposed to fulfill. Waring, an author whose industry has permitted nothing to escape his search into the uses of the various articles of the Materia Medica, gives the following as diseases in which quinine has been employed:

Fevers.			
Typhus.	Puerperal.	Variola.	Intermittent.
Typhoid.	Rubeola.	Erysipelas.	Remittent.
Relapsing.	Scarlatina.	Yellow Fever.	Pernicious.

Periodical Diseases (Malarial Origin).			
Periodical Fever.	Hay Fever.	Tic Douloureux.	Ophthalmia.
Angina Pectoris.	Cephalagia.	Hiccough.	Stricture of Urethra.
Spasmodic Asthma.			

Diseases of the Brain and Nervous System.			
Insanity.	Epilepsy.	Tetanus.	Neuralgia.
Puerperal Insanity.	Chorea.		

Diseases of the Eye.

Ophthalmia.	Nyctalopia.	Hemeralopia.	Iritis.

Diseases of the Thoracic Organs.

Phthisis.	Pleurisy.	Hooping Cough.	Croup.
Pneumonia.	Laryngismus Stridulus.		

Diseases of the Digestive Organs.

Cutaneous Cysts.	Diarrhœa.	Cholera.	Worms.
Aphthæ.	Dysentery.		

Diseases of the Skin.

Erythema Nodosum.	Urticaria.	Pemphigus.

Constitutional Diseases.

Scurvy.	Scrofula.	Syphilis.	Gangrene.

This list of diseases by no means represents the widely extended employment of quinine as a tonic and restorative, as a supposed specific in various forms of disease, and as an agent promoting the functional activity of many organs. Conditions of the organism the most opposed are held to indicate the use of this remedy. Theories the most divergent have been constructed to account for its remedial virtues.

SPECIFICITY.

The most important property of quinine and its salts is the specific action, in virtue of which it can prevent and cure malarial diseases.

Prevention of Malarial Poisoning.—What is the value of quinine as a prophylactic against malaria? Numerous instances have been collected in which those using quinine as a preventive of malarial poisoning, have enjoyed an extraordinary exemption from malarial diseases when exposed under peculiarly unfavorable circumstances.*

* Dr. Bryce, R. N., called the attention of the profession in 1854 (Medical Times and Gazette, Jan., 1854) to the prophylactic power of quinine in preventing those deadly miasmatic fevers which formerly proved so destructive to the crews of the British vessels on the coast of Africa. In the following year Mr. Hayne published an account confirming these statements by numerous observations of his own. The Statistical Reports of the British Navy have, for several years, contained the most conclusive evidence of the prophylactic power of quinine, from the African station. Prof. W. H. Van Buren, M. D., has published a most interesting paper (Sanitary Commission Documents—Military, Medical and Surgical Essays, edited by Dr. Hammond) in which he has collected all the evidence proving the efficacy of quinine in preventing malarial diseases. More recently Prof. Joseph Jones, M. D., has investigated the subject and published his observations in the Nashville Jour-

Does the habitual use of quinine confer absolute immunity? To answer this question satisfactorily it will be necessary to examine the evidence. Two kinds of facts have been reported: 1st. Complete protection of all exposed and for the whole period under exposure; 2nd. Incomplete protection of a small percentage, and apparent failure to protect a still smaller percentage of those exposed. There have been but few instances reported belonging to the first set of facts. Dr. Van Buren quotes one from an authority which we have not seen. "From the day we crossed the bar, in the Pleiad's voyage, I commenced giving quinine solution to all the Europeans on board * * * to three weeks after our return to Fernando Po, a period of one hundred and forty days. *In no single instance could I recognize its failure.*" "The man I could not train into taking it was one of our second mates, who, in the course of our voyage, had a few *severe* attacks of remittent fever accompanied by delirium." In most of the instances reported, although the protection seemed absolute at first, cases of fever, after a time, began to appear. According to the report of Mr. Heath, Surgeon to the "Teazer," "—during our stay in the River Lagos, quinine wine was regularly offered to the men, morning and evening; all took it, I believe, except two midshipmen and two seamen belonging to the galley. These four persons subsequently each suffered an attack of fever, whilst in the whole force, consisting of 220 men, there occurred only a few cases of trifling importance." We have, in this observation, all the factors necessary for the solution of the problem. Equally satisfactory is the following report by Mr. Hayne, R. N.: "The boats were dispatched with 32 officers and men up the Rio Pongo, and remained in the river for two days and nights; one ounce of quinine wine (four grains to the ounce) was given daily to each person; between the twelfth and fourteenth day after leaving the river four slight cases of fever occurred." The steamer "Bloodhound" remained in the Benin river twenty-seven days, and during this time and for fourteen days subsequently, three to six grains of quinine were given daily to each member of the crew, and only six had slight attacks of fever. A boat's crew, consisting of 32 men and officers, spent two nights in the Lagos River. The Surgeon administered quinine wine to all

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cal of Medicine and Surgery. In addition to facts previously known, Dr. Jones gives some valuable statistics never before published. The writer has availed himself of all those sources of information.

of them, and nine out of the party were attacked with fever at periods varying from five to seventeen days.

The most satisfactory statistics, in some respects, which we have been able to find, are those in Dr. Joseph Jones' paper, contained in a report from Dr. Samuel Logan, Chief Surgeon of the 2d and 3d Military Districts, Dept. of South Carolina, Georgia and Florida. "The following table," says Dr. Logan, "was compiled with the view of enabling the writer to arrive at some conclusion as to the prophylactic power of quinine. The items were collected, either by himself or the medical officer in charge. * * * It will be observed, that in no single case was the agent unanimously adopted; in many, indeed, its use was resorted to by a minority only. So far as my object was concerned, this enabled me to compare the results among those situated under the same identical circumstances, in all particulars, except the use or neglect of the agent whose effects we are investigating. * * * All the troops from whom these items have been gathered, were stationed in the most highly malarious regions in the Confederacy. * * * In some cases the quinine was taken in the morning, in others at night, four grains being the quantity used.

Total number who took no quinine,.....239
Of these had fever,.....134
Total number who took quinine irregularly,.....246
Of these had fever,..... 96
Total number who took quinine regularly,.....506
Of these had fever,..... 98
Ratio per 1000 of fever cases to patients, 193.67."

This is in the proportion of 1 to every 5.16. On the coast of Africa the proportion varied from 1 in 8 to 1 in 20. These figures and observations are conclusive as to the prophylactic power of quinine; but how shall we explain its success in most instances, and its failure in a few? There appears to be an increase in the number of cases of fever after prolonged exposure, notwithstanding the use of the quinine is continued. This is explicable, only, on the theory, that, if the same quantity of the quinine be continued, the morbific cause remaining in action, the protective influence slowly declines.

The opinion that the protective influence of quinine diminishes with long continued use, is supported by the fact, that the curative power of this remedy declines with repetition in a case of ma-

larious disease. It cannot be denied, however, that the weight of authority is opposed to the view which we have taken. Prof. W. H. Van Buren* thinks that the facts which he has collected prove that the prophylactic power of quinine is not lost by repeated use. On the other hand, Dr. Newberry, whom Dr. Van Buren quotes, takes the opposite ground. Dr. H. W. De Saussure† makes the following statement:—

"I think that I have been able to collect a sufficient number of data to render the opinion plausible, if not conclusive, that quinine possesses the power of protecting the white man from attacks of intermittent and remittent fever, or its collaterals, when exposed for even long periods to malarious influences; and, moreover, that its daily use is in no wise injurious to health, nor does its habitual use render the system insusceptible of its remedial powers."

Prof Joseph Jones sums up his conclusions as follows:

"1st. Quinine taken during exposure to the exhalations of miasmatic regions, will, in most cases, ward off fever entirely.

2d. If fever attack those to whom the quinine has been regularly administered, its severity and duration will be far less than in those who have not taken the quinine; it therefore not merely wards off disease, but renders it less powerful and destructive when present.

3d. To be entirely efficient, the quinine must be administered for some time, at least ten days, after exposure to the causes of fever."

These observers, with the exception of Dr. Newberry, agree that the prophylactic power of quinine does not diminish by long continued use, and that the protection which it affords is not absolute. The conclusion at which we have arrived may be expressed as follows:

Prophylactic, but the protective influence slowly but certainly diminishes, provided the same quantity be administered daily, and the external conditions remain the same. To insure a continuation of the prophylactic power, increasing doses become necessary, in accordance with the law—to maintain a constant physiological effect which shall be uniform, administration of doses increasing in a regular ratio is required.

The protective influence of quinine against malarial poisoning must be regarded as incontestibly established. This is a fact of

* Sanitary Commission—Quinine as a Prophylactic, etc.

† American Journal of the Medical Sciences, Jan., 1861.

the greatest value to mankind, whether we adopt the conclusion that the protection is absolute for a period and then declines, or that it is incomplete but permanent. The same rule of practice is indicated in either case. If the protective influence were absolute and permanent, and if no ill effects were produced by its prolonged administration, quinine should constitute a part of the daily ingesta of the peoples inhabiting malarial regions. No one has had the temerity to propose such an abuse of the prophylactic. Observations upon the physiological effects of quinine, to be presently detailed, show that the long continued use of quinine does impair certain important functions; it cannot therefore be continued with impunity. Further, it is an axiom, that no remedial agent should be substituted for the protective influence against disease of hygienic means. No fact is better established than that suitable food, clothing, and modes of life, are protective, in a large degree, against malaria of moderate intensity. It follows, therefore, that the protective influence of quinine should be employed in cases where the exposure is great and the malaria concentrated and deadly—conditions which hygienic means cannot successfully oppose. To be properly effective here, the quinine should be given in sufficient doses, and its power should be maintained, by gradually increasing the quantity daily administered. The amount should be graduated to the conditions requiring it. *Ceteris paribus*, an additional grain a day should be added every week. Five grains of the sulphate is the minimum daily allowance. Such, at least, is the conclusion to which we have come, after considerable personal observation, and a candid examination of the facts reported by others.

Acute Malarial Poisoning.—The specific effect of quinine, in curing periodical fever, is the best established fact in therapeutics. But this fact has its corresponding fallacy;—the power to cure malarious diseases is lost under circumstances to be presently detailed. What are the uses and abuses connected with the employment of quinine in curing intermittents, remittents, and other forms of acute malarial poisoning? This question includes period of administration, methods, dose, and the adjuncts to the specific medication.

The necessity for preparatory treatment, although much discussed, is yet *sub judice*. Formerly, in order to secure the best results from the administration of quinine, it was considered necessary to relieve hepatic and splenic engorgement, and the evident

derangement of the digestive organs. The tendency of medical doctrine and practice at the present day, especially of those who so constantly witness the prompt subsidence of the so-called complications, when the antidote is administered, is to regard any preparatory treatment as unnecessary. We do not agree in opinion with the advocates of either practice.

Quinine is successful in the cure of malarial poisoning, in proportion to the acuteness of the attack; in other words, it can neutralize or destroy, very perfectly, the morbific matter, but cannot cure structural alterations. Functional derangement of organs ensues upon the circulation through them of blood charged with malaria. The continued operation of the cause induces at length structural changes in those organs upon which the malaria has a selective action. In a large proportion of cases of acute malarial poisoning, the ground-work of structural alterations has been laid.

If a sufficient quantity of quinine has been administered to neutralize all of the poison present, no changes in the constitution of any organ having occurred, there will be no return of the febrile phenomena.

If, however, changes in the structure of organs have occurred, the periodical attacks are apt to recur from time to time.

Such are the fundamental facts which must resolve the question of preparatory treatment, and not the old idea of a balance in the circulation to be restored and altered "secretions" to be corrected.

As a certain daily quantity of quinine is necessary to prevent malarial poisoning—a quantity fixed within tolerably narrow limits—so also, a certain quantity of quinine, experience has shown to be required for the cure of malarial fever. This has been reduced to the certitude, almost, of a mathematical demonstration.

For the cure of acute malarial poisoning,

Intermittent form,.....20 grains.

Remittent form,.....30 grains.

If the malaria be very concentrated and still in action, these numbers must be multiplied by 2. The experience of the writer enables him to assert with confidence, that, as ordinarily observed, acute malarial poisoning requires these fixed quantities. For exceptional cases, exceptional doses may be necessary.

A great deal of wisdom has been expended in endeavoring to determine the time and the doses in which the necessary quantity

of quinine must be administered, in order to secure the best results. Strange inconsistency! To admit the antidotal power of quinine, and to be perplexed, whether it is best to administer it in small doses during the interval, or in a single large dose before the expected paroxysm, or in the sweating stage.

Can the quinine be given during the febrile movement, without detriment to the patient, and with the maximum curative effect? There are conditions which will test the accuracy of the preceding statements. The following observations were made as the experimentum crucis:

A patient with Tertian Intermittent. Date of observation, November, 8, 1861.

Febrile movement began; 20 grains of quinine given.

Hour	Temperature.	Pulse.	Resp.	
9 A. M.	98.7° F.	90	22	
10	100.4°	78	20	
11	99.7°	72	18	
12 M.	99.7°	70	17	
1 P. M.	98.6°	68	17	
2	98.6°	64	16	
3	97.8°	60	12	
4	98.6°	72	18	Beginning to sweat.
5	97.4°	68	16	Sweating.
6	97.8°	66	16	
7	99.8°	60	15	Sweating profusely.
8	99.8°	61	15	

The influence of the quinine, in first reducing the pulse-rate and respirations and afterwards lowering the temperature, is here most marked. Equally evident is the inhibitive influence of the remedy shown in preventing the normal evolution of the fever. The patient had no return of the paroxysms. The same observations have been frequently made, but it would serve no useful purpose to occupy space in detailing them. The foregoing is a typical case.

The antiperiodic is equally effective, whether administered in the interval or during the seizure.

If time is an element of importance, no delay is necessary, in order to give the remedy in the stage of apyrexia.

To save the suffering and exhaustion of the febrile movement, the attack should be anticipated, and if possible, prevented.

As the maximum effect of the quinine is attained in about five

hours after being taken, it should be administered this period of time, at least, before the expected paroxysm.

As the elimination of quinine takes place with considerable rapidity, (see post,) the maximum curative effect is obtained by the administration of the whole amount required, in a single dose rather than by a succession of small doses.*

Quinine may be introduced into the organism, through several channels;—by the stomach, by the rectum, by the skin, by the subcutaneous areolar tissue. So far as the quality of the effect is concerned, there is no difference in these several modes; but in respect to quantity of effect, there are wide variations between them. We have ascertained, by careful clinical observations and experiments, that four times the quantity is required by the rectum than by the stomach, to produce a given physiological and therapeutical effect. By the subcutaneous areolar tissue, the therapeutical effect of the same quantity of quinine is three times greater than by the stomach. The statement previously made, as to the quantity of this agent required for the cure of acute malarial poisoning, is predicated upon its introduction by the usual channel—by the stomach. The administration of the remedy by the rectum is wasteful, and generally improper, but may be necessary in the case of irritable stomach, and in those who from any cause refuse to swallow. The endermic method is more painful and not so effective as the subdermic, which has taken the place of the former. Considered with reference to the prejudices of mankind, and, provided that no contra-indication exists in the state of that organ, the stomach is the best medium for securing the absorption

* The administration of single large doses of quinine (20 to 30 grains) is American practice. In the Medical Statistics U. S. Army, (1839 to 1855,) we find that this practice is claimed for our army surgeons. This method of treatment is almost universal in those parts of the South and South-west, where the severest forms of malarial fever prevail, but has not been adopted in the Middle and Northern States. Influenced by the example of American army surgeons, the Indian medical officers use large doses of quinine in the treatment of malarious diseases. In the Medical Times and Gazette, for November and December, 1864, we find a communication from Mr. Hare, Deputy Inspector General of Hospitals, in which he claims some originality for the use of 70 to 90 grain doses of quinine, and for giving it "irrespective of all variations of symptoms." "I gave a standing order to my assistants, that the moment a patient was admitted he was to have 20 grains quinine. I saw him myself always a short time afterwards, and gave him another 20 or 30 grains, according to the urgency of the symptoms. * * * Ordinary cases took this dose (20 grains) three times a day, etc." In this reckless use of quinine Mr. Hare has been anticipated, thirty years.

of quinine. It is most effective in the state of solution—one drop of dilute sulphuric acid to each grain of quinine—and when taken into an empty stomach. In the present state of public sentiment, especially in the case of children, considerable importance should be attached to the means of disguising the taste. As the amorphous quinia and the alkaloid itself, are much less soluble in the saliva than the salts, the former may be given to children, and to females. Coating the pills with sugar, is of course effective; but this practice has led to the extensive use of sugar-coated pills, prepared abroad. Examination of these pills, has confirmed doubts of their efficiency. They do not produce the physiological and therapeutical effects, belonging to the quantity of quinine which they are supposed to contain. Having examined several specimens, I ascertained that

One grain pills contained from ¼ to ½ grain;
Two grain pills contained from ½ to ¾ grain.

Tannic acid disguises the taste pretty effectually, in the proportion of 2 grains of tannin to 10 of quinine. Strong coffee is an excellent vehicle for covering the intense bitterness. If sugar-coated pills be prescribed, they should be prepared freshly by the pharmaceutist.

The most effective mode of administering quinine, considered with reference to its therapeutical power, is the method by subcutaneous injection. Dr. Chassaud published, in 1862, an account of the great success which he had obtained in the treatment of malarial fevers in the hospital at Smyrna, by the subcutaneous injection of quinine. He ascertained that the salt, administered in this way, had a more decidedly curative power, without occasioning its usual physiological effects, than when given by the stomach. This practice has since been continued with undiminished success at the same hospital by Mr. Smith. These favorable reports induced trials of the same method in various parts of the world—in Germany, France, India and the United States—and success has everywhere attended it, so that the subcutaneous injection of quinine for the cure of malarial fevers has become an established practice. We have had a large experience in the employment of this method, and can confirm in every important particular the published reports.

It is a remarkable fact, confirming the doctrine of a specific action of quinine, which is irrespective of its physiological effects,

that the cure of malarious disease by sub-cutaneous injection is not necessarily accompanied, by any evidence that can be recognised, of an impression upon the nervous centres. The cure may be accomplished without any disturbance of the vascular system, without any alteration of the normal thermal line, and without any disorder of the cerebral functions. A smaller quantity of the remedy being required, brings the use of this important agent within the means of the poorer classes, and by diminishing consumption, tends to cheapen the price for the benefit of all.

The important question is—Does the quinine, administered by this mode, prove more decidedly curative? No other considerations are of value, if the remedy simply accomplishes as much and no more than when given by the stomach. We have ascertained, by clinical observation, that it has a greater curative power when thrown into the sub-cutaneous areolar tissue, than when administered by the stomach. Three cases of obstinate quotidian intermittent were treated ineffectually by large doses of quinine given by the stomach, but an intermission of considerable duration—12, 16 and 25 days—was obtained in each case respectively by the use, sub-cutaneously, of 5 grains of sulphate. These were cases of chronic malarial poisoning, which is often very rebellious to treatment. The quantity required for the cure of the acute forms of malarial poisoning will vary from 5 to 8 grains of the alkaloid, or 8 to 12 grains of one of the salts. The site of the injection is of little consequence. The solution should, however, be thrown into parts not to be called into use, for more or less pain and soreness follow the application. Sometimes troublesome abscesses result, and in all cases a little inflammation and ecchymosis occur about the point of puncture. Considerable inflammation and abscess are produced if the solution used be too concentrated, or if solid particles are injected. We were so unfortunate as to err in these particulars, in the first use of sub-cutaneous injections, producing large abscesses. We have since used solutions more dilute and carefully filtered to separate solid matters. To obtain a sufficient effect, several injections may be used at the same time and inserted into different parts. Patients will not object to this, if local anæsthesia be induced by the use of Richardson's spray producer. The solution of the alkaloid, quinia, in ether, we have found the least objectionable, and thus far no accidents have resulted from it.

Quinia, one part;
Ether, sixty parts;

or shake any quantity of quinia with pure ether, pour off the supernatant liquid and filter. Sixty parts of ether will hold in solution one part of the alkaloid; but if the ether be allowed to evaporate, a much greater degree of concentration can be attained. One grain of the alkaloid to six minims of ether is the most condensed solution which we have found advisable. When the syringe has been used, it should be washed with ether or alcohol, lest particles of quinia remaining adherent become detached the next time the instrument is used, and be forced into the areolar tissue, producing irritation and abscess.

The solution of the sulphate may also be used for subcutaneous injection. The following formula we have been in the habit of employing:

Sulphate of Quinia, 60 grains;
Dilute Sulphuric Acid, 40 minims;
Distilled Water, 1 fluid ounce.

This should be carefully filtered to separate any undissolved sulphate of quinia, and should be kept in carefully stoppered bottles to prevent any particles of dust gaining access to it. A fluid drachm of this will be a suitable dose for an ordinary intermittent, but this quantity should not be injected in one place.

In acute malarial poisoning, the cause having been but a short period in operation, nothing but the specific medication, in any of the modes already indicated, may appear to be required. But if the cause has remained in action for some time before exploding in a febrile movement, there occur in the functions of organs certain modifications which demand remedial measures. These may be summed up in a few words: lessened production of bile, diminution in the amount of urine secreted and a change in its character, and fullness of the spleen. The elements of bile appear in the urine; this fluid, although preserving its specific gravity, contains, in many cases, traces, and in some a considerable quantity, of albumen (congestion of Malpighian tufts?) The success of the specific medication will be rendered more certain and the abuse of quinine prevented, if these signs of functional derangement of important organs be observed, and the conditions which they denote corrected. These indications we have found to possess a great and unquestionable value. They may be fulfilled by the use of the compound jalap powder, and dilute solutions of bitartrate of potassa, as a diuretic to relieve congestion of the Malpighian tufts.

These adjuncts to the specific medication we have found to shorten the duration of malarious diseases, and to render unnecessary the prolonged use of quinine. It will be perceived that this treatment is supplementary and not preparatory, although cases of the intermittent variety of acute malarial poisoning may occur, in which these remedial measures may, with great propriety, precede the specific medication.

Chronic Malarial Poisoning.—We have now to examine conditions of disease differing in many important respects from the preceding. It will be necessary to have a clear idea of these conditions, in order "to specify well the circumstances which cause a variation in the effects of the agent" whose therapeutical uses and abuses we are now engaged in studying.

Very important changes may be induced in the structure of organs by the slow introduction of malaria, without the production of the objective phenomena of fever. These changes are produced more rapidly and are more pronounced if febrile movements have occurred. These structural alterations are found in the blood, liver, spleen, kidneys and glandular apparatus of the intestinal canal. The writer has been engaged in the study of these changes for several years, and unless reference is made to authorities, he wishes to be understood as having observed the lesions which he describes.

In the blood, the most obvious changes—considered from the point of view of the morphotic elements—are irregularity of outline, notching of the red corpuscles, and an increase in number of the white. A very important condition, described by Frerichs,* and recently elaborately examined by Dr. J. Forsyth Meigs,† is the very large amount of pigment matter found in this fluid, as also in certain other structures of the body. Pigment deposits take place in the liver, producing first a fawn color, which gradually deepens into a bronze, as the amount of coloring matter increases. We have observed this change to occur in cases without being the result of malarious fever, but produced by the toxic effect of small quantities of the malarious poison, whose action extended over a considerable space of time. The alterations in the spleen are of two characters: first, a simple increase in size, due to accumulation of "splenic pulp;" second, hypertrophy, due chiefly to development of the trabeculæ and Malpighian bodies (chronic

* Diseases of the Liver, Syd. Soc. Trans.

† Penn. Hospital Reports, Vol. I.

splenitis?) These changes in the spleen possess the greatest clinical value from the point of view of the uses and abuses of quinine and its salts. Whilst the first occur to a greater or less degree in acute malarial poisoning, and may occur in chronic malarial poisoning accompanied by febrile movements, the second are almost always characteristic of the chronic form of malarious poisoning. The slow introduction of the morbific principle is accompanied in such cases by a gradual increase in the size of the spleen, the tissue of which becomes rather reddish than brown, and attains a degree of firmness entitling it to the term "fleshy." Coincidently with these changes in the spleen, occur the pigment deposits in the liver, and the accumulation of pigment granules in the blood. We have also constantly observed a peculiar bronzing of the skin, especially of those parts exposed to the light. The glandular apparatus of the intestinal canal undergoes certain important alterations. Deposits of pigment matter take place around the orifices of Lieberkuhn's follicles; the solitary glands and the patches of Peyer thicken, and the glands of Brunner become more prominent. These changes in the intestinal glands are, apparently, of the same nature as those which take place in the Malpighian bodies of the spleen, which are supposed by many physiologists to be connected with the lymphatic system, to which the solitary glands and patches of Peyer are also affiliated. Frerichs has shown that pigment deposits occur in the cerebro-spinal axis, and his observations have been confirmed in a very interesting and striking manner by Dr. John F. Meigs.

The kidney is also the seat of peculiar alterations. Dr. Meigs notes the deposit of pigment granules in the Malpighian tufts. Congestion of the Malpighian tufts occurs not unlike that which may be artificially induced in animals by tying the abdominal aorta below the origin of the renal arteries. This congestion of the tufts may be recognized by signs which are very characteristic during life, if search be made for them. The urinary secretion is slightly decreased in amount, but its specific gravity remains up to the normal standard. As there is so little apparent departure from the state of health, attention is not usually directed to the urinary secretion. On examination, it will be found that the urine contains albumen, but no tube casts, and that it is not materially deficient in salts. These signs indicate congestion of the Malpighian tufts, but not disease of the tubules. It is difficult to explain the appearance of albumen. Either some change has

occurred in the albumen itself, increasing its osmotic power, or the congestion of the vessels of the tufts is the factor. The amount of albumen which may appear in the urine will vary indefinitely, and some trace of it will always be found, if carefully and unremittingly sought for. To detect a small amount of albumen, the best method of proceeding is, to let fall a few drops of urine upon the side of a test-tube half filled with colorless nitric acid, so that it may come in contact with the acid, slowly. Coagulation of the albumen will take place at the point of contact. Sometimes tube casts, fatty and waxy, may make their appearance, when, of course, the gravity of the case is much increased, and the symptoms so marked as to awaken suspicion of the nature of the lesions.

Such, in brief, are the changes in the organism produced by malaria. They cannot be omitted from consideration in a discussion of the therapeutic uses and abuses of quinia; nevertheless it it would scarcely be pertinent to the purpose of this essay to describe these changes with more particularity.

Is the therapeutical power of quinia diminished in proportion to the extent of the structural alterations brought about by malaria? We have already expressed a fundamental truth, in the statement that the remedial efficacy of quinia is in proportion to the acuteness of the attack. In other words, the longer the morbific cause has continued in action, and the more extensive the resulting lesions, the less the curative influence of quinia. Some of the greatest abuses of quinia occur in its administration for the relief of chronic malarial poisoning. Continued exhibition of it is necessary to diminish the frequency of the febrile movements, and often without effect, for they return again and again despite the remedy. The bronzed liver and the fleshy spleen appear to be unaffected by it, and so long as these remain in a pathological state, the paroxysms of fever will recur. It is obvious, therefore, that large doses of quinia are improper, in the treatment of chronic malarial poisoning; small doses may be necessary at suitable intervals to neutralize any malarial poison still present in the blood. The importance of medication for the cure of the structural alterations can hardly be overestimated. The methods which we have pursued and have found effective, are as follows: Small doses of the iodide of potassium, sodium or ammonium (one grain) are administered every hour during the day and evening; and the ointment of the biniodide of mercury (Ph. Dub.) is rubbed once a day over the splenic region until vesication is produced.

When the digestion is feeble and diarrhœa is present, dilated nitro-muriatic acid, given in infusion of cinchona, is preferred to the iodide. Sometimes a succession of blisters is applied to the splenic region, and the freshened surface dressed with the compound ointment of iodine. This method of medication is persevered in steadily for several weeks, a five-grain dose of quinine being given occasionally, provided this remedy have not been much administered previously. If the organism have become accustomed to the quinine and is no longer influenced by it, in respect to its specific action, we give in its stead—narcotine—a remedy in point of efficiency as an antiperiodic, next, probably, to quinine. If the malarial cachexia is not pronounced, we frequently employ the following combination: Take of Quinoidine gr. 120, Acid Arsenious gr. 2, Extract Nux Vomica gr. 20—To be made into 60 pills, three to be taken daily. In similar cases, we have found the Syrup of the Phosphate of Strychnia, Iron and Quinia, of unquestionable utility. Iron, the use of which seems to be indicated by reason of the evident anæmia which exists, can accomplish no useful purpose, until the blood-making organs are put into a condition for the proper performance of their functions.

Methodus Medendi.—It would scarcely be proper to omit mention of the recent discoveries which throw light upon the *methodus medendi* of quinine and its salts. Nevertheless, we must not forget—in the language of the philosophical Bouchard—that "the merit of a therapeutic treatise does not consist in ascribing to remedies imaginary virtues in connection with this or that medical doctrine, but in keeping strictly to the results of pure observation." Made with fidelity and recorded with accuracy, observations of therapeutical effects survive the destruction of systems and theories with which they may be connected from time to time. But in an intelligent revision of the therapeutic uses and abuses of quinine, Dr. H. Bence Jones' discovery of "animal quinoidine" in the textures of animals, must have due recognition, not because this discovery enlarges and renders more certain the applications of quinine to the treatment of diseases, but because it proposes to explain its *methodus medendi* in a demonstrable, scientific manner. We should hail with delight all those improvements and discoveries which tend to establish medicine within the domain of the exact sciences.

Dr Bence Jones discovered that a substance resembling quinine—animal quinoidine—"can be found everywhere, by treating any

animal substance, first with dilute acid, then neutralising with alkali, and then extracting with ether," that this natural fluorescent substance, "by its mode of extraction, and by its remarkable action on light, is very closely related to quinine." Having demonstrated the existence of animal quinoidine, Dr. Jones asks,—"Assume that a substance like quinine, exists during health, in the textures, can its rapid destruction and removal through the action of marsh miasm, give rise to ague? Does quinine cure ague by furnishing a substance which retards the changes which go on in the textures? and is the well known property of arsenic to preserve organic substances, have we also the explanation of its power in curing ague?"* Researches complementary to those pursued with such distinguished success by Dr. Jones, have been undertaken in this country, by Drs. Edward Rhoads and William Pepper.† These gentlemen have attempted to demonstrate "whether there might not be, as an attendant upon the pathological processes in malarial disease, a rapid and marked diminution in the amount of animal quinoidine naturally existing in the tissues." Their conclusions are embodied in the following:

"This series of observations, though unfortunately limited, owing to the rarity of cases which had not received more or less of one of the cinchona alkaloids before coming under observation, seems to indicate, by the uniformity of the results obtained, a close connection between the diminution of 'animal quinoidine' and malarial disease. Whether such diminution be invariably a consequence of the action of the miasmatic poison in the human body, can however, only be determined by a more extended course of investigation. Still less can we attempt to deduce from the facts here presented, any satisfactory estimate of the influence of the various types of malarial disease, or of the duration of the disorder. But it would appear probable, as from cases II and VIII, that a comparatively short time suffices to effect a marked reduction in the normal amount of the fluorescent substance."

Dr. Bence Jones has shown that the introduction of quinine into the organism, causes a rapid increase of the animal quinoidine. To render the demonstration complete, it remains to be shown that the absence or destruction of the fluorescent substance found in the textures in the natural state, is the cause of periodical fever, and

* Medical Times and Gazette, Aug. 18, 1866.

† Penn. Hospital Reports, p. 269, et seq.

that malaria prevents the conversion of albumen into animal quinoidine, as supposed by Dr. Jones.

That these conditions have some relation to the production of periodical fever, is evidenced in the extraordinary development of pigment matter in the blood, and in the escape of albumen through the Malpighian tufts of the kidneys. Further, it will be necessary to prove that the fluorescent substance is not formed, or that existing, destroyed, only in those diseases in which quinine manifests the power of specificity. These facts being demonstrated, the mode in which quinine cures, will then be perfectly plain; but when this is accomplished, how shall we explain the *methodus medendi* of arsenic, spiol, narcotine and other anti-periodic remedies?

These investigations only furnish us an explanation of a method; they do not add to our means of cure. So far as the therapeutic uses and abuses of quinine are concerned, they do not extend the boundaries of existing knowledge; but the least practical fact of science, is often the origin of most important results. The investigations which will follow the discovery of Dr. Jones, may lead to great improvements in our knowledge of the *modus operandi* and of the *methodus medendi* of remedial agents—subjects the most uncertain and difficult in the whole range of medical science.

Physiological Effects.

The action of specificity, cannot, in general, be explained by the effects observed when a remedy is exhibited in the physiological state. Nevertheless, a careful study of the physiological effects, must precede the rational therapeutical employment. Clinical observation and experiments must correct the errors arising from the difference in effects produced in physiological and in pathological states. "Methodical empiricism," is, according to Renouard, the true foundation of therapeutics, but whilst admitting the value of empirical facts, we should not underrate the importance of a knowledge of the physiological effects of remedies, for the use of many of the most approved agents has been derived from observation of their action in a healthy organism.

Absorption.—That quinine is absorbed into the blood has been so conclusively demonstrated, it were hardly necessary to do more than simply affirm the fact. The manner of its absorption and the rate and degree of elimination, are debatable questions, in respect to which it may be desirable to offer some new observations.

Experiment 1st. Ten grains of a solution of sulphate of quinine were thrown into the peritoneal cavity of a cat. On the following day not a trace of the salt could be detected in the serum found in the cavity.

Experiment 2nd. Five grains of the etherial solution of quinine were thrown under the skin of the thigh of a cat. In twelve hours distinct traces of the alkaloid were discovered in the juices of the parts.

Experiment 3d. Same quantity as in preceding experiment, injected subcutaneously, but in twenty-four hours it had disappeared. The juices of the parts were not examined for fluorescence.

Experiment 4th. Took at 6 P. M., 20 grains of the sulphate made into pills. Passed some urine, 10 oz., in an hour; at 10 o'clock, passed 2 oz., and at 12 o'clock ½ oz. Then retired, and on rising evacuated the bladder, discharging nearly four ounces. These specimens gave the following result:

Maximum amount of quinine obtained from urine, passed at 12 M.
Minimum, from urine passed in the morning.
No trace of alkaloid in urine passed at the end of the first hour.

Whole amount of alkaloid recovered, 3 grains.

No doubt the elimination continued for twenty-four or more hours, but circumstances prevented the collection of the urine. As elimination occurs from the mucous surfaces in various situations, it is difficult to estimate in this way, the amount which remains in the organism. To arrive at an approximate result, I preserved and examined all of the urine (experiment 5th), passed by a patient in 36 hours, to whom had been administered 20 grains of the sulphate for the cure of a tertian intermittent. I recovered from this but 2 grains of the alkaloid. The amount appropriated by the tissues was estimated at 5 grains, but there are many sources of fallacy in such a method. We are the less concerned about this, however, for the reason that Bence Jones by his nice processes, has been enabled to resolve this question with a degree of precision not before attainable. He traced the passage of quinia into the various tissues of a guinea pig. The following extracts embody his results:

"When sulphate of quinine is taken, like Ethiam and other substances which I brought before you last year, it rapidly passes from the blood into the textures.

"Even in a quarter of an hour, after four grains of sulphate of quinine, the fluorescence may rise to 75 grains to 100 litres. It is

found in the greatest amount in the liver and kidney; rather less in the blood, urine and muscles; still less in the brain, nerves and bile; and is perhaps even in this time increased in the lens of the eye.

"In three hours the maximum effect of the quinine may be reached. It amounts then to from 100 to 200 grains of quinine in 100 litres. * * * In six hours the amount of fluorescence was rather less than in three hours. In twenty-four hours it was considerably less than half as much as in three hours. In forty-eight hours, except in the liver and blood, there was but little more fluorescent substance in the textures than naturally existed there. And in seventy-two hours the liver showed no trace of increase of fluorescence. Hence in fifteen minutes, the quinine had passed everywhere. In three hours it was at its maximum and remained in excess for six hours. In twenty-four hours it was much diminished, and in forty-eight hours was scarcely perceptible."*

These results, obtained by an examination of the degree of fluorescence, correspond very closely with our conclusions based upon an observation of the effects of the remedy upon the organs of circulation.

Influence in the metamorphosis of tissue.—The effects of malaria upon the blood and textures, are early exhibited in a great increase of uric acid and the urates, and in the appearance of albumen in the urine. The excess of uric acid and urates, indicates rapid waste of tissue and deficient oxidation. In all cases of malarial poisoning, it will be found that these evidences of disorder of the secondary assimilation, are present in a greater or less degree. They were exceedingly well marked in the subject of experiment fifth. In this case, as indeed in all others examined, there occurred a most prompt disappearance of the uric acid and the urates and a corresponding increase in the amount of urea, after the administration of quinine.

Quinia therefore appears to promote oxidation in the tissues, or the normal metamorphosis, but it does not yet appear whether this is a result of its power to neutralize malaria or of the simple addition to the textures of a principle, (animal quinoidine) necessary to their nutritive changes, and which is destroyed by the toxic agent circulating in the blood.

Effects upon the Nervous System.—There are two factors, the character of whose action is known, by the aid of which we may

* Medical Times and Gazette, op. cit. August 16, 1862.

form an estimate of the mode of action of quinine upon nervous tissue. The first result of an increase of the fluorescent substance in the brain, must be an increase of oxidation; the second, an interference with the production of nervous force, the result of diminished oxidation.

When small doses of quinine are taken by a healthy individual, at sufficient intervals to permit the elimination of one to take place before another is introduced, a feeling of comfort, of increased power, an undefinable exhilaration, not, however, considerable, is experienced. In the case of an individual who had long been accustomed—not however for the prevention of malaria—to take several times each day, a grain dose of quinia in a little whisky, this effect seemed to follow; at all events, he assured the writer, that the influence of the whisky without the quinine, was not what his nervous system craved.

The writer, although fully conscious of the difficulty of correctly estimating subjective sensations, has perceived these effects by the use of small quantities of quinine. A slight degree of fullness of the head, an increase in the pulse rate, a sensation of calm, an elevation of ideas and vigor of thought, seem to be produced in the physiological state. We have subjected these effects to an experimental test. If small quantities of quinine—$\frac{1}{4}$ grain—be occasionally thrown under the skin of a cat, it will be found that the animal departs from its ordinary morals, that it becomes more playful and lively, and that its eye becomes brighter.

If small, medicinal doses of quinine be taken frequently—2 grains every hour for 8 hours—by the fourth hour, a decided sense of fulness in the head, *tinnitus aurium*, flashes of light before the eyes, intolerance of light, are experienced, and these effects are maintained during the whole period of administration. The pulse is increased in frequency, and a slight elevation of temperature may be noted. Different effects follow the introduction of the whole amount at one dose. A prompt accumulation of the quinine takes place in the nervous centers; the functional activity of the cerebrum, cerebellum, and medulla oblongata is lowered; the special senses are obtunded; hence the subjective sensations of the patient—the pain and uneasiness produced by the remedy—are rendered much less acute, and of course more endurable. When 20 to 30 grains are administered, the patient soon falls into a state of quietude; he does not sleep; he does not think; he has a confused sense of pressure in the cranial cavity; he feels best and is most content to

lie perfectly still. The special senses are affected as follows: the sight is dim, the pupil dilated; the hearing obtuse; the smell faint; and the taste unnatural. The power of voluntary motion is somewhat impaired; the gait is staggering, but this is due in part to the giddiness and to the derangement of the peripheral nerves—the senses of touch and pain being perverted.

The physiological effect most interesting in the therapeutical sense, is the influence of large doses of quinine upon the organic nervous system—upon the action of the heart, the contractility of the arterioles, and the temperature. These effects we have studied *in propria persona*—(Experiment 4th.) The following are the effects observed upon the pulse, respiration and temperature when 20 grains of sulphate of quinine were taken.

Pulse.	Respiration.	Temperature at 4 P. M.	Temperature of experiment, 70° F.
70	18	97·8°	at 4 P. M., when experiment commenced.
71	18	97·9°	at 7 "
67	17	97·2°	at 8 "
65	16	97°	at 9 "
62	17	97·4°	at 10 "
68	17	97·6°	at 11 "
70	18	97·9°	at 12 "

If a frog, prepared for examination, of the circulation in the web of the foot, by the microscope, receive two grains of quinine under the skin, (*Experiment* 6th) the following appearances will be noted: diminution in the caliber of the vessels under examination; cardiac impulse less strong; current more uniform, but not retarded in point of velocity. If the thorax be carefully opened and the heart exposed, (*Experiment* 7th) and quinine be then injected subcutaneously, a marked decrease in the force and frequency of the cardiac pulsations will be noted. This experiment should be compared with another in which the heart is exposed, no quinine having been introduced. Somewhat different results are observed if a warm-blooded animal be the subject of experiment.

Experiment 8th.—The heart of a kitten was carefully exposed while under the influence of chloroform. As soon as the effect of the anæsthetic subsided, five grains of quinia (the ethereal solution) were thrown under the skin. Within a few seconds, there occurred suddenly a tumultuous action of the heart—the force and frequency of its pulsations were increased, and the rhythm disordered; this increased action was followed by the opposite effect in about ten minutes, when the movements became slow and orderly and the force diminished. That the first effect—or stimulating action of quinia—was not due to the ether injected, was shown in

another trial in which the solution of the sulphate was employed. It remains to be shown that the act of injecting a fluid subcutaneously, which of course occasions more or less pain to the animal, is not the cause of the primary effect observed. This was shown (*Experiment* 9th), by administering the injection when the animal was anæsthetized—an evident increase in the force and frequency of the cardiac pulsations being then observed, but not so marked as in the preceding experiments.

In all of these observations, the respirations were seen to be lessened in frequency, and increased in volume. The temperature of the surface was lowered from .5° F. to 1° F. These results correspond very closely with those obtained by an examination of the effects in the physiological and pathological states. Is there any explanation of the effects of quinine upon the heart, the respiration and the temperature?

M. Eulenberg* has attempted to show that the effect observed upon the heart, is not a result of an influence exerted upon the *par vagum* and *medulla oblongata*, and that it is still produced when the vagi are entirely divided. He considers the result due to the action of the agent upon the muscular tissue, and the excito-motor ganglia situated in the substance of the heart itself.† As the pneumogastric is generally conceded to be the inhibitory or regulator nerve of the heart, it might have been supposed that the inhibitory action of quinine was to be referred to the influence of quinine upon that nerve. The experiments of M. Eulenberg prove that this is not the true explanation. A stimulating action is undoubtedly exerted by the sympathetic system upon the movements of the heart. Reflex action through this system, as Bernstein has shown, may stop the movements of the heart. In this fact we have an apparent explanation of the inhibitive effect of quinine.

M. Eulenberg has noted another fact which we have confirmed by clinical observation and by experiment; i. e. the lowering of the general sensibility. He observes upon this point—"Some minutes after the poisoning, simultaneously with the feebleness of respiration, there may be observed in animals an absolute lack of perception of external irritants." We have noted (*see experiment* 4th,)

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* Archives Générales, April, 1867, p. 494.

† This explanation is supported by the fact that if a solution of quinine be injected into the veins of an animal, paralysis of the heart soon takes place. All the systematic writers admit this, and we have verified it by actual trial.

a reduction of the external temperature in the human subject, and have stated as a clinical fact, that large doses of quinine diminish obviously the sensibility to irritants. These are correlative facts. The diminution of sensibility is a peripheral lesion, occasioned by lessened nutritive changes in the periphery. The influence of the sympathetic nervous system over the nutrition of tissue is too well known to require explanation. In addition to these physiological and pathological facts, we have the exact chemical determination of Dr. Bence Jones showing how the normal production of animal quinoidine is temporarily arrested by the "incoming quinine, causing probably, a stoppage of the fresh formation of quinine from albumen." It is unnecessary, however, to enter upon any theoretical explanation; all the facts go to show that the action of quinine is chiefly exerted upon the nervous system of organic life. As the animal quinoidine is increased in the brain as in other textures of the body when quinine is administered, it is reasonable to suppose that the nutritive changes in this organ are also interfered with and the production of nerve force diminished. The lessened activity of the special senses, and the lowering of the general sensibility, together with the other subjective phenomena of cinchonism would appear to render it probable that these effects are due to the increase of the quinoidine in the gray matter; but as we have seen, the depressions of the heart's action, the decline in the temperature of the surface, etc., are more certainly the result of the impression of the quinine upon the vaso-motor nerves.

Effects upon the Blood.—The observations heretofore published, as respects the influence of quinine upon the blood, are exceedingly contradictory. We have therefore devoted much time and labor to the elucidation of this question. In the human subject, it is of course difficult to make observations free from sources of fallacy. The existence of disease, especially a disease like malarial which so rapidly despoils the blood, vitiates the result. There are insuperable difficulties in the way of testing the influence of quinine upon the blood in the physiological state, for no experimenter would be willing to subject himself to the serious injuries which such a course of investigation would involve. There are two methods, then, which may be pursued: 1st, to make observations on animals; 2d, to estimate the influence of quinine when used for a considerable length of time in diseases not of malarial origin. One method may be used to correct the errors of the other.

The results of experiments on animals have been so uniform that it will be unnecessary to repeat the details. The mode in which the quinine is introduced does not appear to vary the effects. The proportion of red corpuscles was diminished and the fibrin somewhat increased; excrementitious products—uric acid, creatinine, cholesterine, etc., were increased. The clot had little firmness, and manifested a strong tendency to putrefactive decomposition.

Effects upon the Primary Assimilation.—Small doses of quinine and its salts, produce the effect of a stomachic tonic, provided the remedy be not too long continued. Habitual use of small doses, or large doses even when occasionally administered, derange digestion and impair the primary assimilation. Irritation, and even inflammation of the mucous membrane are produced by large doses. The bad influence of quinine upon the blood when long used, is often due to the local irritation set up in the stomach and intestinal canal. Wasting, emaciation, and hectic we have seen result from the use of large tonic doses, kept up for several months. The symptoms observed were a peculiar pallor, feebleness of the muscular system, trembling; the urinary secretion was changed in character, being loaded with urates and phosphates: the bladder was irritable, the skin dry, the evening temperature was elevated and the pulse was small, quick and excitable. Some of these symptoms were due to the influence of the remedy upon the nervous system; some to the derangement of the primary assimilation; and others to the interference in the metamorphosis of tissue.

There is an apparent contradiction in the therapeutical and physiological effects, as respects the influence in the retrograde metamorphosis of tissue. It was asserted that the quinine administered for the cure of malarial fever, promoted oxidation of tissue and the conversion of uric acid into urea. Administered in the physiological state, we find that imperfectly oxidized products accumulate in the blood. This is not a real contradiction. In the one case animal quinoidine being deficient in the textures, and in the other, being in excess, the normal metamorphosis is disturbed, and imperfectly oxidized, or immature products are the result. When in malarial fevers, the animal quinoidine is raised to the normal standard, by the ingestion of quinine, tissue changes take place more perfectly.

Rational Therapeutics.

A study of the physiological effects of quinine, will serve no useful purpose unless we obtain some certain indications of its therapeutical uses and abuses. Are we now in a position to use quinine in disease with greater certainty and success, by reason of a more thorough knowledge of its mode of action in the physiological state? We believe that this question may be answered in the affirmative. Small doses of quinine administered at suitable intervals, produce those effects to which the term *tonic* is applied. For a temporary purpose, quinine may be used as a tonic, a stomachic or restorative, but the prolonged use is objectionable, and defeats the object to be accomplished. The truth may be expressed as follows:

The tonic influence of quinine is temporary, and should therefore be employed, only when a prompt effect is required. Its prolonged use results in spanhæmic, rather than hæmatinic effects. As a tonic, it is indicated in acute rather than in chronic diseases.

Fevers.—A careful examination of the large number of facts which have now been accumulated, and considerable personal experience and observation, have satisfied the writer of the inutility of quinine, in the treatment of Typhus and Typhoid fevers. Not only has this remedy no influence over the course and duration of these affections, but its irritant effects upon the gastro-intestinal mucous membrane, and its inhibitive influence exerted through the organic nervous system, upon the heart and lungs, render it positively injurious. This remark is true, not only of the method proposed by Dr. Dundas, of Liverpool, which consisted in attempts to shorten the duration of these diseases by large doses of quinine, but true also, of the practice now much in vogue, of giving repeated small doses for the production of a tonic effect. We have seen the dryness of the tongue, the diarrhœa, the subsultus, and the delirium of typhoid fever, increased so constantly by it, that we do not hesitate to declare the administration of quinine in this disease an abuse of that remedy.

In certain parts of the United States, the prevalence of a mixed type—typho-malarial—has seemed to justify the use of quinine in continued fevers; but even in this composite disease, it is used more freely than necessary. It becomes less and less effective, as the *typhi* element predominates. In malarial regions of the interior valley, as populations grow, the typhi element in fevers be-

comes more pronounced, and the propriety of the use of quinine less and less evident. When the malarial element predominates, the use of quinine is indispensable; but the quantity should not exceed five grains at a dose, which may be administered daily, for six days. Nothing but evil results from the prolonged use of the remedy. The action of specificity will be wrought by the quantity above named; to give more will not only fail to benefit the patient, but will add to the existing lesion of the intestinal canal, an irritation of its own. We have found that by the rectum—*by suppository*, or by clyster—is the best channel through which to introduce the medicament into the organism, in cases of fever, thus avoiding the ill effect upon the gastric mucous membrane.

For the pneumonia which not unfrequently complicates typhoid fever, quinine is a valuable remedy; but the circumstances under which it is indicated, and the manner of employing it, will be subjects for consideration hereafter.

Cerebro-Spinal Meningitis.—The employment of quinine in this disease has heretofore been entirely empirical. By some, quinine has been given in large doses, on a theoretical view of the malarial origin of cerebro-spinal meningitis; by others, as a part of the general supporting plan of medication. Success has not attended the use of this remedy; nevertheless, it has its place in the treatment of this disease, and is, indeed, in our view, a remedy of the greatest value, if rightly employed. In the beginning of the disease, when the alterations of cutaneous sensibility first occur, and before the febrile movement has obtained much intensity, a full dose—20 to 30 grains—will moderate, in the most satisfactory manner, the violence of the disease. Given, during the progress of the case, in small or large doses, quinine not only does not lessen the severity and shorten the duration of the disease, but does serious mischief. If, therefore, a single large dose does not produce a good result, it is useless to repeat it, or to pursue a tentative plan by small doses.

The theory governing the use of quinine in this way, is based upon its physiological effect upon the vaso-motor nerves. Whatever may be the correctness or incorrectness of the theory, the practical fact remains, that this method of using quinine has, in the few cases in which we have had the opportunity to employ it, been signally effective.

Acute Inflammation.—The authorities agree as to the impro-

priety of using quinine during the acute stage of the inflammatory process. There are two conditions, however, in which, according to our experience, it is often exceedingly useful: the stage of congestion, or the formative stage, of an acute inflammation; and the stage of resolution. An attack of acute catarrh may be aborted by a ten grain dose of quinine, administered when the first symptoms appear. So, also, idiopathic pleuritis, pericarditis and peritonitis, may be rendered much more manageable, if not entirely cut short, by a large dose of quinine, given in the very incipiency of these diseases; but it is necessary, in order to achieve so successful a result, that the stage of effusion or exudation be not reached. We have not observed any evil result to follow, in those cases in which the remedy failed to abort the disease. Opium or morphia may be combined with it, to accomplish the object in view more perfectly, but the effect of the quinine has been frequently tested in these cases, without the conjoined influence of the narcotic.

In inflammation of parenchymatous structures, we have not been able to obtain the abortive effect. This failure may have been due to the difficulty of recognizing the earliest symptoms of inflammation. In the stage of resolution of inflammation, and in congestion without the formation of inflammatory products, a large dose of quinine will often cure in the most speedy manner. These effects we have observed in pneumonia, which may be taken as the type of an inflammatory affection. Quinine is indicated in this disease when the chlorides re-appear in the urine. Twenty grains should be given, in four doses, at intervals of six hours, commencing when the evidence of the return of the chloride of sodium to the urine is satisfactory. Congestion of the liver, enlargement of the spleen and orchitis, we have frequently cured by a few full doses of quinine. The use of this agent in orchitis is especially satisfactory, because here we are enabled to observe the success or failure of the remedy, beyond question. In orchitis we have used it, when the organ has ceased to enlarge, and never during the time it was enlarging. Quinine ceases to be useful, whenever alterations of structure or exudations take place. It seems to cure, therefore, in these cases, by virtue of its influence over the vaso-motor nerves—a fact derived from a study of the physiological effects.

Influenced by these considerations, the writer has employed quinia with benefit, in several cases of cerebral disease, in which

he had reason to suspect the existence of that condition of the vessels of brain described so well by Bellier, under the term—"aneurismal dilatations"—a various condition of the vessels, produced by atheromatous degeneration of the arterial tunics. We have had no experience in the use of quinine in those cases of congestion of the nervous centers, in which it has been proposed by Brown-Séquard.

Neuralgic Affections.—The lowering of the general sensibility, produced by large doses of quinine, affords a rational indication for its use in neuralgic affections. In the periodical neuralgic affections, of malarial origin, the curative power of quinine is unequivocal, but in this case the action is one of specificity. We are here concerned with its therapeutical applications in the treatment of neuralgia not of malarial origin. That it is curative in some of these cases, has been conclusively established, but the causes of its success or failure are not as well understood as is desirable. In general, it may be affirmed that quinia is successful, only against functional disorder of the sensory nerves, and is not effective in the case of centric lesion or irritation of the trunk of a nerve. To produce a curative effect in any case, it is essential that large doses be given; a decided impression must be made upon the nervous centre, presiding over sensation; hence ten grains must be considered as the minimum. In the case of neuralgic affections, not of malarial origin, the subcutaneous injection of morphia and atropia, is so superior in respect to promptness and efficacy, that the administration of quinine for this purpose must be considered an abuse, rather than a legitimate use of the remedy.

Empirical Therapeutics.

Experience and observation have furnished us with some of the most important applications of quinine and its salts. Also, some of the greatest abuses of this remedy, are found amongst the empirical facts, the traditional lore of therapeutics.

The question of the value of a remedy in the treatment of a given disease, is invested with no little difficulty. So little is positively known of the natural history of disease, that it is often impossible to separate the *post hoc* from the *propter hoc*, and the constant tendency is, to confound the effects of the remedy with the natural progress of the case. Fully impressed with these difficulties, we have taken the greatest pains to estimate, in an impartial manner, the real value of quinine, in the treatment of the various affections in which it is now used.

Periodical Affections.—Quinine having demonstrated its curative power in periodical fevers, it was a reasonable presumption that it would be equally effective in other periodical diseases, in accordance with the axiom—"a remedy which has cured one disease, must also cure analogous diseases."

There are two classes of periodical affections in which quinine is employed:

In periodical affections of malarial origin;

In other diseases occurring in an organism saturated with malaria, when the periodical type is ingrafted upon an otherwise continuous local or constitutional affection.

The periodical affections of malarial origin are due to the slow inhibition of malaria, without the production of the objective phenomena of fever. The malarial cachexia is induced, but instead of the normal ebullition of fever, there occurs some supplemental affection of the nervous system, or of the thoracic or abdominal organs.

A. *Periodical Affections of the Nervous System.*—We are embarrassed by a difficulty of diagnosis in these diseases, for the reason that the neuroses are essentially periodical in character, when no suspicion of a malarial origin can attach to them. The existence of the malarial cachexia, and the more uniform regularity of recurrence, will enable us to distinguish the neuroses of malarial origin, from the other functional disorders of the nervous system. The following are diseases of the sensory portion of the nervous system, which have been produced by malaria:

Neuralgias,	Cephalalgia,
Tic Douloureux,	Cervico-Occipital,
Cervico-Brachial,	Dorso-Intercostal,
Mammary,	Lumbo-Abdominal,
Crural,	Sciatic,
Gastralgia,	Enteralgia,
Hepatalgia,	Nephralgia,
Ovaralgia,	Hysteralgia,
Angina Pectoris,	General Neuralgia.

These various forms of neuralgia may occur as an expression of malarial poisoning, being substituted for the normal expression—fever—or they may assume the orderly periodical character, in consequence of having occurred in an organism already under the influence of the malarial cachexia. There are no means at present known to science, by which these may be distinguished, until ten-

tative experiments have been made by quinia. If they are of malarial origin, the action of specificity of quinine will speedily prevail against them; otherwise, this remedy will only modify the phenomena, and will not prove curative.

It may be positively affirmed, that these malarial neuralgias require for their successful medical treatment, the maximum doses; and the same fact is true of all the irregular manifestations of malarial poisoning. Small doses, frequently repeated, generally fail to cure; from 10 to 20 grains, according to the severity and obstinacy of the attack, are necessary, and the paroxysm should be anticipated from three to five hours; but it is not necessary to await the subsidence of the attack, for the pain ceases as the physiological effects of the remedy become manifest. The rule which we have indicated for the employment of quinine in fevers is equally applicable here.

The method by subcutaneous injection is the most effective way of applying the remedy. Either of the solutions already recommended for hypodermic use may be employed in the interval, but if the injection is to be made during an attack, the solution of sulphate of quinine should have added to it a sufficient quantity of morphia—¼ of a grain to each injection. Of course, the selection of the locality of the injection will be governed by convenience, and need have no relation to the seat of pain, unless the prejudices of the patient interfere.

Disorders of Motility.

Epilepsy.	Locomotor Ataxia.
Chorea.	Asthma.
Laryngismus Stridulus.	Hiccough.
Hay Asthma.	Stricture of Urethra.

The difficulties in the way of forming a correct diagnosis, are much greater in these disorders of motility, than in the neuralgic affections. A correct conclusion can be reached only by a careful study of the attendant circumstances and previous history. The principles of treatment are the same as those already indicated for the disorders of sensation.

B. *Periodical Affections of Thoracic Organs.*—The Pneumonia of the South and South-West, which is a very common and fatal disorder, assumes the periodical character because occurring in organisms already surcharged with malaria. In the colored race, the true malarial pneumonia is somewhat more common than in

the white, probably for the reason that in the former, malarial *fevers* are not apt to occur.

The quinine does not appear to have specific action in either of these conditions, but the treatment by quinine has been a great improvement upon the antiphlogistic plan, which caused a fearful mortality. The large doses which are, by some southern practitioners, habitually employed in the treatment of malarial pneumonia, are not only unnecessary, but do positive mischief. We have already indicated the conditions in which quinine possesses a curative power:—in the stage of resolution when the chlorides reappear in the urine. During the stage of red hepatization, the continued use of quinine in large doses is harmful; small doses for the production of the so called tonic effect, are negatively useful, because they take the place of the antimonials and mercurials formerly so much employed.

Pneumonia is very commonly an intercurrent disease, coming on during the course of chronic malarial poisoning. So far as the morbid anatomy of the lung is concerned, this form of pneumonia does not differ from the preceding, but the alterations which have been induced in various organs by the long continued action of malaria, render this intercurrent disease exceedingly formidable. The lavish use of quinine in this affection, as practiced by many physicians, is without justification—for, as we have seen, the changes induced in various organs are not at all under the control of this remedy.

C. *Periodical Affections of Abdominal Organs.*—The following are the intercurrent malarial disorders affecting the abdominal organs:

Diarrhœa,	Jaundice,
Dysentery,	Enlargement of the Spleen.

These are, sometimes, simply vicarious substitutes for febrile movements. Nothing can be more satisfactory than the use of quinine under these circumstances. More commonly, however, the diarrhœa, dysentery and jaundice, are results of the alterations in the intestinal glandular apparatus and liver, over which the quinine has no control. This fact is also exhibited in malarial enlargement of the spleen. In this affection quinine is supposed to be peculiarly effective, and to exert an action of specificity; but all who have observed carefully, know that quinine exhibits a curative power only in cases of simple enlargement, and is inoperative against chronic splenitis or the "fleshy spleen."

As a Tonic.—Quinine is much and indiscriminately used, in all forms of disease in which a tonic is required. For a temporary purpose, for sustaining the powers of life in fevers, in the exanthemata, and in acute inflammatory affections in general, its use as a tonic is rational, and has the sanction of experience. The existence of stomach and intestinal disorder, of certain states of the tongue—as a dry, brown and fissured, or a smooth and glossy state of that organ—contra-indicate its employment. But if we examine without prejudice, its influence in these states of the system, we shall be convinced that the apparent good effect of quinine is rather negative. To the radical change which has occurred in the last quarter of a century, in the treatment of disease, is to be attributed the good results of modern practice, and not to the use of any particular agent. Quinine being one of the agents most relied on in pursuing the new method, has had ascribed to it, therapeutical powers of which it is not possessed. Its employment frequently degenerates into abuse. The irritant action which it exerts upon the gastro-intestinal mucous membrane, and the derangement of both the primary and secondary assimilation which results from its continued use, renders its therapeutical employment in many of these cases positively injurious.

The same facts are applicable to the determination of the value of quinine in the treatment of the various chronic affections in which it is now so freely employed. The popularity of this remedy, is a direct result of the change of medical practice from the anti-phlogistic to the expectant and supporting plan of medication. The good results attributed to quinine are really due to the tonic and supporting regimen. In no disease is this more strikingly exemplified than in scrofulous ophthalmia. Formerly treated by lowering measures as an inflammatory affection, the results were most unfortunate; cinchona was afterward used empirically with great success; at the present time it is known that nutritious diet with general supporting measures are equally effective.

Is quinine capable of that sustaining influence to which the term *tonic*, is really applicable?

A tonic is a remedial agent capable of accomplishing either of two objects:

Improving the primary assimilation, and blood-making process.

Restoring to the Blood some principle in which it is deficient.

To the first category, belong the mineral tonics, especially iron and manganese, the mineral acids, the alkalies under certain cir-

ditions, and the stomachics. To the second, belong iron, cod-liver oil, (molecular basis of the chyle), and nutrients generally.

It is evident that quinine cannot be classed with either of these two varieties of tonic medicines. Its continued use deranges the primary assimilation and the blood-making process; it does not restore to the blood, material in which it is deficient.

In Acute Rheumatism.—The treatment of rheumatism by bark introduced by the English medical practitioners at the close of the last century, was revived by the French, who substituted quinine. This practice has found an able advocate in M. Briquet, the author of an elaborate treatise on quinine. Sixty grains a day for three or four days were given, with the expectation of jugulating the morbid action. Serious symptoms having been induced in many cases, and death having resulted occasionally, it was discovered that these large doses were unnecessary, equally good results having been accomplished by a smaller quantity. Great success was claimed for this method. It was certainly a great improvement on the old method of repeated bleeding, and the lessened duration of the disease when treated by quinia seemed fairly attributable to this remedy. The profession was not then in possession of facts which rendered a correct conclusion possible. Nothing was known positively of the natural history of disease. In order to form a just estimate of the value of a remedy in the treatment of acute rheumatism, we must know something of the natural history of that disease. The physicians of Guy's Hospital* having shown us that acute rheumatism left to itself, has a tendency to amend about the seventh day and to get well about the fourteenth, we know the inutility of giving quinine in that disease, with a view to a curative effect. Nevertheless, in cases of protracted convalescence, quinia in conjunction with other appropriate medicaments, is sometimes useful.

In Sweating.—The administration of quinine for the relief of sweating, has long been a well established empirical practice. Its use in that case, is based upon the incontestible principle—"a remedy which cures one disease, will cure all analogous diseases." This axiom is the foundation of instinctive, as well as rational empiricism. Experience not only confirms the truth of this principle in respect to the curative influence of quinine in cases of sweating, but we have a satisfactory explanation of the *modus modandi* in certain of the physiological effects of that drug.

* Guy's Hospital Reports, Vol. xii.

The sweating which accompanies malarious disease, the perspirations of phthisis, and that relaxation of the skin accompanied by profuse secretion of the sudoriparous glands, which occurs in states of debility, are all more or less under the control of quinine. To the influence of this remedy over the vaso-motor nerves, is to be attributed the curative power.

Comparative Value of the Salts of Quinia.

Variety of combination, has not increased the therapeutic power of quinine. It appears to be of little consequence with which particular acid the base is united. It has been supposed that combination with kinic acid—a form in which it exists in the cinchona barks—would present some advantages, but experience has shown that this is not the case. So, also, it was believed that the ferrocyanate and the arseniate would possess some special powers, but these expectations have not been realized. For ordinary purposes, the sulphate is the best salt for internal use, and for subcutaneous injection, the solution of the alkaloid quinia in ether is preferable.

If it be desired to aid the action of quinine by iron, by arsenic or other anti-periodics, it is better to combine them in extemporaneous prescription.

The Indian medical officers to whom we are indebted for many improvements in therapeutics, have lately shown that the cure of malarious diseases may be accomplished more successfully by the conjoined use of quinine and arsenic, than by either agent alone. They do not, however, prescribe the arseniate of quinine; neither do they combine these remedies in the same prescription. Quinine is administered in large doses at long intervals, and the arsenic in the form of Fowler's solution, three times a day. The efficiency of this plan of treating malarious diseases, we have confirmed by repeated observations.

The tannate has been, and is still preferred by many practitioners because less objectionable in respect to taste, but its difficult solubility in the gastric juice renders its utility exceedingly questionable. The valerianate is nauseous as to odor, and although less irritant in its local action than the sulphate, is rather inferior in therapeutic power, to the latter. The supposed anti-spasmodic properties of valerianic acid, rest upon no certain foundation; and if admitted, it does not follow that the valerianate of quinia possesses them.

Substitutes for Quinia.

A variety of considerations give interest to the investigation of the substitutes for quinine. The increasing cost and scarcity of the cinchona barks has awakened no little solicitude as to our future supply. Fortunately the naturalization of the Cinchona trees in India and the improved means of culture by which the percentage of the alkaloids in the barks may be increased, render it certain that, hereafter, the quantity of this indispensable medicine will be ample for all purposes. Independently of this, however, it is desirable to increase the resources of therapeutics. Cases occur, in which from idiosyncrasy or accident of disease, quinia cannot be administered. It is important, therefore, that the medical armamentarium be provided with additional remedies for the treatment of periodical diseases.

It would serve no useful purpose to enter with minute particularity, upon a consideration of the anti-periodic power of arsenic. Nevertheless, there are certain practical points in relation to the administration of quinine and arsenic respectively, which require elucidation. For the treatment of acute malarial poisoning, quinine is unquestionably the appropriate remedy, but arsenic may be advantageously combined with it as already indicated. In chronic malarial poisoning, the relative value of arsenic is much greater. Certain structural alterations peculiar to this state, not at all under the influence of quinine, are cured by arsenic. We refer to the fleshy spleen, and the thickened and elevated solitary glands and patches of Peyer. These alterations of the intestinal glandular apparatus find expression in an intractable form of chronic diarrhœa. A large personal experience warrants the assertion that this troublesome disorder is more certainly curable by arsenic than by any other remedy.

The salts of cinchona, salicine and beberia, possess no advantages over quinine and are greatly inferior in curative power.

Next to quinia and arsenic, we have found narcotine to be the most valuable of the anti-periodics. As it is much less irritant, it is preferable in acute cases accompanied by stomach and intestinal disorder. In some obstinate chronic intermittents, we have had lately, considerable success with narcotine.

Conclusions.

In passing over the various topics, conclusions were generally stated after an examination of the questions involved. It may be well now, however, to sum up briefly in a tabular form the facts developed in the course of this essay.

Specifically.	Quinine is prophylactic, but power declines with use. Cures acute malarial poisoning. Without influence upon the structural alterations of chronic malarial poisoning, and only effective temporarily against the febrile movements. The discovery of animal quinoidine only serves to explain the *modus medendi*, but does not add to our knowledge of the therapeutical uses.
Physiological Effects.	Quinine is rapidly absorbed and excreted. A part remains in the tissues, increasing animal quinoidine. In pathological states, (malarial poisoning), increases oxidation; in physiological, retards oxidation. Exerts an inhibitive influence upon heart and arterioles. Impairs primary assimilation, and damages the blood.
Rational Therapeutics.	In states of congestion—Incipient inflammation. In stage of resolution. Methodus Medendi—Through vaso-motor nerves. In neuralgic affections.
Empirical Therapeutics.	In periodical diseases. In intercurrent diseases. As a tonic.
Abuses.	In chronic malarial poisoning. In fevers. In acute rheumatism. As a tonic in acute and chronic diseases.

ARTICLE V.

TREATMENT OF PARALYSIS BY HYPODERMIC INJECTIONS OF STRYCHNINE,

WITH REMARKS ON INFANTILE PALSY.

Read before the Convention, May 25th, 1868.

BY M. GONZALEZ ECHEVERRIA, M. D.,

Superintendent of the Malespas House for Epileptics and Paralytics at Lake Malespas, N. Y.

THE subject I am to bring before the notice of the Convention is not new, although it has scarcely attracted the attention it deserves. With the exception of Charles Hunter, late Surgeon to the Royal Pimlico Dispensary, who has just published in the British and Foreign Medico-Chirurgical Review, for April, 1868, an interesting communication, "On strychnia hypodermically administered in paralytic affections," and the two French physicians, whose researches will be presently alluded to, I am not aware of any other writer making particular reference to the value of subcutaneous injections of strychnine for the relief of paralysis.

Not to spend valuable time, I will endeavor to present an abridged account of the principal cases bearing on this important question of therapeutics, and other no less interesting and heretofore undecided points, relative to the pathology of infantile palsy.

In 1859, Dr. Behier, of Paris, read before the Imperial Academy of Medicine, a paper on the use of medicinal hypodermic injections for the treatment of neuralgia and other nervous affections. Reference was made in this communication to the successful injection of a solution of 10 centigrams of sulphate of strychnia to 30 grams of distilled water, in seven cases of paralysis, of which four were cured and the remainder improved. These latter were two instances of hemiplegia from cerebral hæmorrhage, and one of paraplegia from diphtheritic angina, with paralysis of the palate and mydriasis. One patient, with paralysis of the right leg, recovered

after the very first injection, along the course of the sciatic nerve. Three others were cured—one with four, and the rest with six injections. One of these latter had paralysis of the deltoid, from lying on the arm during sleep. In one female paraplegic the subcutaneous application of 100 drops of the solution was practiced, together with the internal exhibition of six grains of the extract of nux vomica. Recovery was obtained after paralysis of two and a half years standing.

Prof. Courty, of Montpellier, ("On the employment of local injections in neuralgia, paralysis, and other affections," Journal de Medicine et Chirurgie Practiques, Nov. 1853,) injected a few drops of a solution of strychnia along the course of the facial nerve, between its exit through the stylo-mastoid foramen and its crossing over the neck of the condyle of the lower jaw. The injections were repeated each second or third day, and from three to six sufficed to remove entirely; within from ten to fifteen days, all traces of paralysis in every muscle of the face. The patients were one male aged 56, and two females aged respectively 25 and 22. In every instance recovery was complete. Professor Courty has also recorded a case of paralysis, of a year's standing, unsuccessfully treated by other means, which readily yielded to a few subcutaneous injections of strychnine in the lower part of the spine.

Seven cases are included in the recent paper of Mr. Hunter. Four of hemiplegia, one of paraplegia, one of paralysis of the arm, and the last of jactitation with pain, sickness, and debility of the spine. In the case of paraplegia attended with symptoms indicative of myelitis, ten injections produced a great increase of walking power with diminution of the numbness and trembling of the limbs. Three hemiplegias are reported as having recovered from their trouble. A fourth, with great improvement, remained yet under treatment. In one of these patients, hemiplegia was consequent upon a bullet having entered near the posterior border of the right scapula, and lodged somewhere close to the spinal marrow. The instance of paralysis of the arm was due to bruising and dislocation of the shoulder joint. Recovery took place after seven punctures. The doses usually employed were the $\frac{1}{12}$ of a grain of the sulphate of strychnia, and in one case of hemiplegia, they varied from $\frac{1}{32}$ to $\frac{1}{12}$ and $\frac{1}{20}$ of a grain. Four months after being cured, this patient had cramps in the leg, which were removed by the hypodermic injection of $\frac{1}{3}$ of a grain of morphine. The disease was respectively of six and of two and a quarter years standing, in two of the hemiplegias.

The remarkable results in the foregoing instances, have caused me to present this summary of their most striking points, before I describe the principal examples coming under my observation during the past five years. I have selected them as evidences of subcutaneous injections, proving by themselves an efficient means of treatment; as not infrequently, in other cases than paralysis, I associate this and other means, when I desire to obtain some of the effects to be hereafter described.

Case I. In 1864, a soldier came into one of my wards, at the Central Park U. S. A. General Hospital, New York, who had become paraplegic after being all night on picket duty, in water up to his knees. He complained a great deal of formication and numbness in the feet. The limbs were cold, bluish, and had lost tactile and painful sensibility up to the knees. He could be pinched, pricked, and burned, in both legs, without being conscious of it; yet, he would complain of deep-seated pain in the feet and legs. His urine was abundant with lithates. His bladder and bowels were torpid. The internal use of strychnia and tonics, with the application of electricity to the limbs, slowly relieved their paralyzed condition. I then injected hypodermically $\frac{1}{20}$ of a grain of sulphate of strychnia in each leg below the knee. The operation was repeated four or five times, at intervals of three days, and from the first injection, the patient, to his great joy, could walk without crutches, and found himself eased of formication in the legs, which finally recovered their power. The effects noticed after the first puncture, were, a general feeling of warmth, with marked diaphoresis, a peculiar countenance, with a sardonic smile, respiration increased, and at times quite sighing, diminution of numbness and pain, with return of sensibility in the skin of the legs, which became firmer, the patient being at once able to get up from the chair and walk around without supporting himself. These prompt results were witnessed by Dr. G. S. Winston and my other colleagues at the Hospital.

Case II. A gentleman, after sudden exposure to cold, whilst much fatigued playing tenpins, became paralytic in the right leg. The paralysis, from the onset, was associated with pain, which soon became so intense that the patient lost all rest, being in constant agony. It was thought that he had articular inflammation. Blisters over the hip joint, and narcotics were frequently resorted to, but with slight temporary relief. Meantime, the muscles of the thigh and leg began to waste, the hyperæsthesia per-

sisting to such a degree that the slightest touch of the skin of the leg would give him great pain. In this intolerable condition he determined of his own accord, to try electricity, and felt some comfort upon its application. He consulted me at this time. He was pale and unhealthy looking—the pulse weak and 85. The right limb was wasted, cold, and still very sensitive, especially on the anterior and external parts of the leg. The urine was acid, of normal specific gravity, and contained chlorides in excess. I continued the application of electricity, after having $\frac{1}{30}$ of a grain of strychnine injected into the thigh. The result was prompt. He felt, after the first puncture, more power and warmth over all the limb. The pain diminished, and for the first time he was able to enjoy a night of uninterrupted rest. I noticed very particularly, in this case, that the pupils dilated soon after the puncture—this, and general diaphoresis, being among the first results, together with more or less gurgling of the bowels, which seems to be one of the earliest effects of the subcutaneous injection of strychnia, and which I have also most constantly observed, before any other phenomena, after hypodermic injection of morphine. The same dose of strychnine was injected three times more, at intervals of four days, and followed by the above effects. Sensibility then became quite natural. A tonic regimen, together with electricity, the hot and cold douche to the limb, and two more subcutaneous injections of $\frac{1}{30}$ of a grain of strychnine, finally restored power to the paralyzed muscles. My friend, Prof. T. G. Thomas, of New York, saw this patient, and the results of the above treatment, from the beginning.

Case III and IV. The following is the report of the simultaneous occurrence of paralysis in two children, brother and sister; the boy one and a half years old, the girl three. Both were toward the end of the summer seized with symptoms of spinal meningitis, the disease in either case seeming to have been produced by their sitting on the wet grass. I saw these children, in consultation with Profs. Metcalf and Thomas, when they had passed the acute stage of the disease. The girl had completely lost the power of both legs and right arm. The boy was only, and in a less degree, paraplegic. Both were healthy looking children, and had had no other disease. The treatment employed by the above mentioned gentlemen benefitted them until the paralysis remained stationary, notwithstanding the internal use of strychnine, iodide of potassium, and tonics. The limbs, particularly those of the

girl, were cold and flaccid, and with the exception of the paralysis nothing abnormal could be noticed in either child. I suggested the employment of hypodermic injections of strychnine, which being approved, I injected five times,—once every three days,—$\frac{1}{30}$ of a grain over the lower part of the spine and in the legs of the boy, who, in the course of six weeks, was able to walk, with a very slight unsteadiness. From this date, tonics, strychnine by the mouth, warm baths and electricity, finished the cure. The progress of the girl was slower. During three months she had fourteen injections of $\frac{1}{30}$ of a grain of strychnine. The legs gained strength, so that she could stand and walk, though quickly getting fatigued, and the arm and hand recovered power to grasp much more firmly. Electricity and a general treatment were kept up with her as with the brother, and she was benefitted considerably, though not cured, when the treatment had to be discontinued, on account of the absence of the parents from New York. I examined the urine of these children before injecting the strychnine. It was found highly charged with uric acid and triple phosphates. I could not possibly say that any marked modification was detected in the secretion after the subcutaneous employment of the strychnine. The temperature of the limbs was always raised after the injection. The frequency of the pulse was also augmented. The capillary circulation was rendered more active in the limbs, exhibiting large red patches, more intense in the vicinity of the punctured region. This condition would last three and even four days after the operation. The injections were attended with perspiration of the head and limbs, more profuse with the girl than with the boy. The pupils were always dilated, and gurgling of the bowels would persist some minutes after the puncture. Another very perceptible result was the fibrilar contractions, or twitching of the muscles in the limbs, lasting for a minute or two, and which I have found prolonged for more than an hour, in other similar cases.

Case V. In February, 1856, I was consulted by Dr. G. A. Sabine, on the case of a boy four years old, affected with paraplegia, which had existed for two years. The paralysis had been preceded by fever. The muscles of both legs were very much wasted from the knee down to the feet, which were in a high degree affected with talipes equinus. The child could only move about on his knees. He had scarlatina a few months before, and was at this time free from renal trouble, but with bronchitis. This condition

was, indeed, rather discouraging to entertain any hopes of improvement. Both limbs were quite cold, and of a purplish color; the skin dry, and the circulation very much depressed. Under such circumstances, and learning that the most judicious course of general treatment and strychnine had failed to bring about any amelioration, I urged a trial of the hypodermic injection of strychnine, and local applications of electricity to the palsied muscles. And here may I remark, that no evidence of contractility was detected during the first applications of the induced current to the paralyzed muscles, with the exception of the gastrocnemii, which feebly answered to an intense current. A fact controverting the absolute statement laid down by Duchenne de Boulogne, that such an unresponsive state of the muscles is an evidence that they have undergone a fatty degeneration, and consequently passed beyond cure. The hypodermic injection was practised in the anterior regions of the legs, $\frac{1}{20}$ of a grain of strychnine being introduced in the tibialis anticus. It was impossible to ascertain any of the general effects produced, on account of the excitement and crying of the child. The circulation of the leg, however, became more active, the temperature of the skin was raised, and the limbs continued warmer that night and most of the following day. I persisted, during four months, with the subcutaneous injection every third day, and the daily application of electricity for half an hour, and the muscles were not slow to develop and recover strength, to such a degree that the child was able in the month of June, to stand and walk, with the assistance of an orthopedic apparatus. Having gone to the country for the summer, the hypodermic injections were interrupted. The child, however, kept on improving, to the time at which I last saw him, in September, 1867.

Case VI. I attended, with Prof. L. A. Sayre, a boy ten years of age, with hemiplegia supervening upon fever and gastric derangement. The left limbs were involved, the leg being much atrophied, cold, and very sensitive, especially near the joint. The left pupil was larger than the right. Capillary circulation in the cheek and ear of the same side was very irregular, the skin of those parts presenting congested patches. In addition to these symptoms, from the beginning of the disease he had been troubled with epistaxis difficult to stop. The galvanic excitation of the lower limb, or the hypodermic injection of strychnine into it, was attended with a greater immediate dilatation of the left

pupil, increased conjestion with higher temperature of the face, dizziness, and perspiration of the left hand. These phenomena were very perceptible at the beginning of the treatment, and subsided with the improved condition of the limbs.

The epistaxis was invariably preceded by redness of the left ear and cheek. More than thirty hypodermic injections were practiced in this case, and although the muscles gained in size and strength, and the limbs grew firmer, the deformities of the feet prevented the child from walking without support. When I last heard of him, this latter difficulty had been in a great measure overcome by orthopedic treatment, instituted by Dr. Sayre.

Case VII. I might also allude here to the case of a girl twelve years old, a patient of Prof. Wm. H. Van Buren. She had been paraplegic from infancy, and to prevent the deformities consequent thereupon, tenotomy had been performed in nearly every muscle of the lower extremities previous to her coming under Dr. Van Buren's care. At the time of our consultation, she was mainly following the movement cure treatment, associated with tonics and hygienic means proper to promote nutrition. She could not walk without support, a great deal of the impossibility depending upon spinal curvature and deformity of the pelvis and hip joints. The muscles of the leg were atrophied and the circulation of the extremities very sluggish. For several months I made semi-weekly injections of from $\frac{1}{20}$ to $\frac{1}{30}$th of a grain of strychnine and also applied the induced current to the muscles. These rapidly increased in growth, the circulation became regular, and as the limbs grew firmer, the girl could bear her weight and walk more easily with a cane, but always with the peculiar gait due to the distortion of the pelvis. In this patient, increased activity of the circulation with greater warmth and power in the limbs, was very perceptible for some hours after each puncture; $\frac{1}{30}$th of a grain of strychnia was apt to cause stiffness of the limbs, if the injection was made over the lower region of the spine—and also giddiness with a feeling of great warmth all over the body.

Before relating two instances in which the hypodermic injection of strychnine originated phenomena of pseudo-intoxication, I may be allowed to mention the curious case of a Mexican, who, after being kept all one night in a cold damp prison, had, the next day, facial paralysis on the left side. The attack commenced with violent prolonged chills and pain, with numbness extending throughout the arm to the fingers. He continued to have regularly, a par-

oxyum of intermittent fever every morning with an exacerbation of the paralytic symptoms. He had never had ague. Quinine broke the periodical fever, but the paralysis persisting, I made three hypodermic injections of $\frac{1}{30}$th and $\frac{1}{40}$th of a grain of strychnine and the paralytic symptoms entirely disappeared. The dilatation of the pupils and diaphoresis of the head and neck were very marked in this instance, and from the first injection, the patient lost the feeling of numbness and heavy weight which he experienced in the paralyzed side of the face.

I pass to the two most interesting cases. A boy aged ten, from Elizabethtown, New Jersey, who had enjoyed previous good health, suddenly became paralyzed. He was in the beginning feverish and grew weaker and weaker, until the limbs finally lost all power. Six weeks after the attack he was altogether powerless, lying in bed and could only move slightly the fingers. He did not exhibit signs of impoverished nutrition, nor want of development, although the limbs seemed rather small and were cold. He complained of chilliness and numbness in the extremities. The pupils were largely dilated. There was a constant itching of the nose. His bowels were either constipated or too loose, without any obvious reason for it, accompanied by itching of the rectum. The appetite was good, lungs and heart sound, pulse 98 and feeble. No headache, or any other symptom worth noticing. Suspecting the disease to be the effect of helminthiasis, I directed the boy to take four santonine dragées twice a day, and two grains of calomel on the third day at bedtime. The next morning he passed an ascaris of a deep pinkish color. He complained during the day of headache with a most peculiar and disagreeable sensation in the stomach. He could not describe the feeling which upset and made him very nervous. The anti-helminthic treatment was continued for a few days to be sure that all worms were expelled. The condition of the boy in the meantime improved. He was capable of raising himself in bed, had more power over the hand, and regained the use of his arms—the legs, however, remaining as palsied as before. I prescribed a tonic treatment and strychnine dragées of $\frac{1}{30}$th of a grain to be gradually increased to three a day, nutritious diet with coffee, exercise, an alkaline tepid bath every day, etc. The improvement kept up satisfactorily, but as the mother wished to remove the boy before Christmas to Olean, N. Y., where she lived, I determined to make a hypodermic injection of strychnine in each of the limbs. This was one of the very first instances in which I resorted to such means, and I confess that I was very particular as to the

strength of the solution, which I prepared myself, dilating $\frac{1}{20}$th of a grain of strychnine in two drops of distilled water. I also employed one of Tieman's syringes, so constructed that by turning a small button connected with indentations of the piston this could be pushed in, and every indentation that was advanced, exactly displaced one drop of the solution. The patient was at the time using daily three dragées containing each $\frac{1}{30}$th of a grain of strychnine. The injection was practised in the afternoon, and $\frac{1}{20}$th of a grain deeply introduced into each thigh. The boy was very fretful at the idea of the operation, which was, however, performed without giving him any pain. I injected first the right thigh, and about two minutes after, the left. In two minutes more the boy commenced to sigh and to have a meaningless smile, with stiffness in the jaws soon passing into real trismus. The pupils were largely dilated, the face congested, and tetanic spasms of the respiratory and cervical muscles followed. Every attempt to articulate a word awoke a spasm. He could neither speak nor be touched without being seized with a jerk, and the whole surface of the body was in perspiration. Notwithstanding the trismus and the impossibility of articulating, the boy could swallow some water after the spasms had begun. The mother feeling very anxious at this condition, I made the boy inhale some ether which relaxed the spasm of the muscles before it induced complete anæsthesia. A mixture containing half an ounce of spirits of turpentine was thrown into the rectum, the ether discontinued, and in about three quarters of an hour, the unpleasant effects completely disappeared. He then stated that he remained conscious all the time, and that the questioning of his mother about his state made him feel badly, bringing on the attacks at every attempt to answer her. At the same time he was much gratified to feel more power in his legs, that he could stand and bear his weight on them, and that he could move them for the first time since he was taken sick. The subcutaneous injection of strychnine was not repeated, but the boy continued with the above treatment and in two days started for home very much improved. I recently learned that he completely recovered.

The other instance in which I noticed similar effects, was that of a little girl six years old, whom I attended with Dr. G. A. Sabine. She had paralysis of the left leg, after fever and gastric disturbances occurring seven months before I saw her. The tibialis anticus, the peroneal and the muscles of the thigh were very much atrophied, the girl being unable to flex the left foot. She had been

submitted to tonics and strychnia with very slow advancement, and upon consultation, we judged best to use the hypodermic injection in the limb in addition to local hot baths and electricity. In a period of more than a year, I made thirty-six subcutaneous injections of $\frac{1}{30}$th of a grain of strychnine repeated once a week. The effects from the commencement, were more activity of the circulation and greater warmth, firmness and growth of the paralyzed limbs. The increased activity of the peripheral circulation was most manifest on the corresponding side of the face and neck, with dilatation of the pupils, especially when the girl was languid or exhausted. On one occasion, the child being very pale and tired, I injected $\frac{1}{30}$th of a grain three days after she had had the same dose. The puncture bled more than at other times, and as usual, I remained watching the effects of the injection. In about eight minutes she complained of giddiness and was soon seized with trismus and opistothotonos. The tetanic spasms were not violent, and were accompanied by general perspiration, congestion of the face and enlargement of the pupils. Inhalation of ether readily dispelled these symptoms. The girl, however, remained, when the ether was discontinued, with sudden starts preceded by dilatation of the pupils, which ceased when an injection of turpentine was passed into the rectum. During the spasms a good deal of flatulence escaped from the bowels, which did not act in five hours after the injection. After a tepid bath she had a long sleep, and awoke very thirsty with a peculiar sensation in the tongue as though she had a thread in it, but otherwise in her natural condition, and with pulse 78.

I am sure that the quantity injected in this case, and afterward repeated without such unpleasant consequences, was $\frac{1}{30}$th of a grain. The only way to account for such occurrence would be the rapid passage of the injection into a vein and the languid condition of the child. We cannot think of accumulated effects since strychnine was not used by the mouth, and the previous injection was made three days before. To finish with the case, I will remark that I saw her last spring, when she was able to walk without dragging the foot, and showed only a slight difference between the power of flexing the two feet.

I could adduce other instances in which I have employed hypodermic injections of strychnine with beneficial results, should the above examples be considered insufficient to demonstrate the importance as well as the security of such means of treat-

ing paralysis. My purpose, however, in here alluding to the subject, has not been to extol the virtues of a new remedy, but to point out that the results observed by the physicians already quoted and by myself, strongly indicate the cardinal part of the sympathetic in the pathogeny especially of infantile paralysis. This is a question that I have discussed at length in my essay "On the pathological anatomy of reflex paralysis, and its relation to the sympathetic system," and I could hardly treat of it within these narrow limits. The effects of strychnia are widely different when administered hypodermically or by the mouth. By the latter method, the quantity may be repeated and increased, unsuccessfully, as manifested in the cases of Hunter and in those here related, and yet a smaller dose of the substance, exhibited hypodermically, be capable of regenerating at once the lost muscular power. I must acknowledge that I have not tried the injections of strychnine in cases like that seemingly of myelitis, reported and successfully treated by Mr. Hunter.

Returning to the consideration of the difference of action according to the method of administration, it is quite plain to me, and undoubtedly to the gentlemen of the Convention, that the reason shows itself in the very nature of the phenomena observed, for they are those peculiar to the action of the sympathetic system—the source of all irritability and center of movement, controling the functions of nutrition and reparation altogether independently of the spinal cord. These are far from being theories, they are legitimate deductions from what I have been able to detect upon repeated investigations of the nervous system in infantile paralysis. I have made reference in my paper on reflex paralysis, to the sclerosis and amyloid degeneration of the spinal cord existing in infantile palsy. There are again instances in which no such degeneration appears to have been discovered by competent observers, and at this moment the celebrated Duchenne de Boulogne in his researches "*On pseudo-hypertrophic or myo-sclerosic* paralysis," published in the Arch. Gen. de Med., January to May, 1868, states that no alteration of the nervous centers has thus far been found in the only case in which the investigation was made by the distinguished Cohnheim, former assistant of Virchow. This new curious form of infantile paralysis created by Duchenne, is characterized by an increased volume of the muscle consequent upon the interstitial multiplication of connective tissue between the primitive fibers. The disease as remarked by Duchenne is not common, and whether

it is entitled to the separate nosological place that he gives it, I am not prepared to dispute. Nevertheless, the sclerosis that gives such a hypertrophied appearance to the muscles I have myself discovered in ordinary cases of infantile paralysis, extending to a few muscles and with the very structural changes described by Duchenne after examinations made by Ordonez. Furthermore, this sclerosis I have again found, when the spinal cord was apparently free from damage, confined to the peripheral nerves, the ganglia, the muscles, and even the capillary vessels of the paralyzed limbs. I examined the whole spinal cord, the ganglia of the cervical and lumbar plexuses, and some of the muscles of the limbs of a young man who died under my care at the Charity Hospital, New York. He was hemiplegic since infancy, could hardly speak, and had paralytic talipes equinus and contraction, with deformity of the hand. I studied most carefully several portions of the muscles of the leg and arm. In many of them, I discovered a fatty substitution, but in others this was replaced by a great abundance of connective tissue, the primitive fibers being in many places quite transparent, and having several nuclei. The size of these muscles was larger than natural. What more attracted my attention, was, that from the periphery to the ganglia, the nerve fibers were nearly absent, and replaced by this fine fibrilar tissue also abundant in the ganglia, where the few cells spared were very dark, granular, and easily disintegrated. In this extensive degeneration, the spinal cord was not throughout equally involved. It exhibited in many places a transparent gelatinous appearance, more manifest in the gray substance, and noticeable only under high magnifying power. There was very little increase of connective tissue in the posterior columns, but the anterior were completely destitute of nerve fibers, and the neuroglia was infiltrated with brilliant amyloid corpuscles. Some of these were also discovered in the lumbar ganglia. Here was, therefore, an example of degeneration involving the spinal and sympathetic systems. I may state in addition, that in two cases of epilepsy with local paralysis dating from infancy, I have not been able to detect any definite change of the spinal cord: whereas the sympathetic ganglia, nerves, capillary vessels and muscles of the paralyzed limb showed in different degrees an alteration similar to that already described. Therefore, I am led to believe that to the sympathetic, and not to the spinal system ought we to ascribe the principal origin of infantile paralysis, as well as that of some of the peripheral and reflex paralyses. The effects of the hypo-

dermic injections of strychnia add confirmative evidence to this view, the only one accounting for the peculiar localization of the paralysis as well as its obstinacy and long duration, without involving the spinal cord. Finally, one remark as to the manner of performing the injections. Generally, I insert the trocar of the syringe deeply into the paralyzed muscle and draw part of it out to avoid throwing the solution directly into a blood vessel. The injection should be practiced very slowly; by having a solution with $\frac{1}{24}$th or a smaller fraction of a grain to the drop, the strychnine may be so diluted as to allow carrying its action at the same time into more than one of the palsied muscles. The general effects are more rapid and decided when the solution penetrates no deeper than the cellular tissue, or when the puncture is made along the spine. It is obvious that the quantity of strychnine in this way required for the treatment is a great deal smaller than in any other. Mr. Hunter mentions that in two out of about twenty-five patients in whom he injected strychnia, a carbuncular state of the nose, or rather a collection of small boils arose. One was the patient with the gunshot wound in the spine, the other, a case of muscular prostration consequent upon, according to Brown Sequard, conjestion of the spinal marrow. I have the record of forty-eight cases in which I have resorted to the subcutaneous injection of strychnia, and do not find such results noticed in any of them.

ARTICLE VI.

OBSERVATIONS,

ANTE-MORTEM AND POST-MORTEM,

UPON THE CASE OF THE LATE PRESIDENT DAY.

BY PROFESSOR S. G. HUBBARD, M. D., NEW HAVEN.

Read before the Convention May 25th, 1853.

The value and interest attaching to the statement of a case of disease, often depends as much upon what is known of the personal history of the individual during his life, as upon the pathological appearances noticed after death; and where the semeiological and pathological facts are connected in the relation of sequence, the lessons which they teach are doubly valuable and instructive.

With regard to the eminent man whose case forms the subject of this paper, some other facts, not strictly pertinent, or perhaps necessary, may not be without interest.

Jeremiah Day was born in Washington, Conn., August 2d, 1773; and during the war of Independence was old enough to appreciate the nature of the issues involved in that struggle, and well remembered having seen some of the principal actors in it.

His infancy and boyhood were marked by indications of feeble vitality; and the prospect of his arriving at the maturity of manhood, never very flattering, sensibly diminished as he approached that period. He entered the Freshman class in Yale College in 1789, but was soon obliged to leave college on account of a "pulmonary difficulty," which was, doubtless, the incipient stage of the organic disease of the lungs which subsequently developed itself. These symptoms were so far alleviated that for two years he taught a school in Kent and Winchester, when he found his health so much improved that he returned to College and was graduated in the Class of 1795.

The succeeding six years, a period of great feebleness, were spent partly in teaching at Greenfield for a year, as tutor in William's College for two years, and as tutor in Yale College for three

years, during which last period he studied Theology, and preached occasionally in vacant churches in the vicinity, until 1801, when he was elected Professor of Mathematics and Natural Philosophy in the College.

He was prevented, however, from entering upon his professorial duties, by the occurrence of an alarming pulmonary hemorrhage, which happened after a Sabbath service at West Haven where he had preached for Rev. Dr. Williston. Other hemorrhages followed, by which he was greatly prostrated, losing large quantities of blood. According to the prevailing practice of that time, he was freely bled from the arm—"the doctors taking," as he remarked to me, "nearly all of the little remaining blood in his body."

In this condition of extreme exhaustion, at the age of twenty-eight, he abandoned temporarily the purpose of entering upon the duties of his professorship, and in September of that year, he made a voyage to Bermuda to try the effect upon his health of a warm climate. While there, he was treated with Tincture Digitalis to the extent of producing its cumulative effects, which were so profoundly sedative that for a time his life was despaired of. Indeed so reduced and attenuated was he on leaving home, that none of his friends expected to see him again alive, and the published letters of Professor Kingsley and others, of that period, lament him as already lost to science and the world. He returned, however, in the following April, but without having experienced any material benefit; so that he now gave up entirely all idea of fulfilling his College appointment; and bidding farewell to his associates, he retired to his home among the hills of Washington, to die.

The hemorrhages continued, and were followed by venesections, until a Dr. Sheldon of Litchfield, who enjoyed a wide reputation for "curing consumption," chanced to see him, and casually remarked that he needed Iron"—and "he believed he could help him."

Although the patient was evidently in a hopeless decline, he was placed under the care of Dr. Sheldon, who would seem to have been an acute observer, and in his knowledge of pathology and therapeutics, far in advance of his time. Under the use of preparations of iron with bark, and nutritious food, Mr. Day soon began to exhibit signs of returning strength and health; and in 1803, although he seemed to his friends literally like one raised from the dead, he was so far restored to health, as to be inaugurated as professor.

From this time all symptoms of pulmonary disease disappeared, and did not return.

From 1803, Mr. Day continued uninterruptedly to discharge his professorial duties, until he was elected to succeed Dr. Dwight as President of Yale College in 1817; and he performed the arduous duties of the office, without serious disturbance of his health, until 1836, when at the age of sixty-three, he first became aware that he had some affection of the heart, as indicated by its irregular and intermitting action.

On several occasions, at the College chapel and at his own house, he was attacked by alarming syncope, which continued for a considerable time, and probably led him instinctively to adopt the slow, cautious and measured step, by which the present generation have mostly known him in our streets.

It was the opinion of Dr. N. B. Ives, who was his physician for many years, that it was a case of cardiac hypertrophy; and this opinion was corroborated by the subsequent diagnosis of Dr. Pennock of Philadelphia—at that time the highest authority in this country, in diseases of this class. He will be remembered by some present, as the editor of the first American edition of Dr. Hope's classical work on diseases of the heart.

The attacks of syncope were treated on general principles; but the frequent attacks of palpitation, and irregular tumultuous action of the heart, were treated by Dr. Pennock's advice, with cupping between the scapulæ, and always with relief. He was also blistered along the spine, and took half a grain of digitalis and a quarter of a grain of calomel three times a day with vegetable tonics.

Dr. Ives has told me that as the patient advanced in years, he drew less and less blood by cupping, until finally, only dry cups were applied—and it was noticeable that they were followed by the same degree of relief as when blood was drawn, suggesting the idea that possibly they might of themselves have been sufficient to relieve the congestion from deranged nervous action which was believed to exist.

The increasing frequency of these attacks, however, admonished him so constantly of the necessity of leading a quiet and more retired life, that in 1846, he resigned the Presidential office, which he had held for twenty-nine years; and for the last twenty years of his life, he devoted himself to letters and the society of his friends —daily expecting to die suddenly, at any moment—yet he lived

far beyond the allotted years of man, with an amount of organic disease seldom exceeded—and finally died *of old age*.

My professional acquaintance with President Day, dates only from about 1860. He frequently consulted me on account of diarrhœa, by which he was much debilitated; the attacks being attended with fever, and sometimes with great cardiac disturbance. The promptness with which he rallied from these attacks, and the surprising sensitiveness of his system to the action of tonics and stimulants, resembled the susceptibility to the impressions of medicinal agents which characterizes the period of infancy. He has often told me that he never experienced a headache.

He was never known to complain of the vesical irritation, which is so very common in old men; but for a number of years it was believed that he suffered severely from this cause—frequently showing by suppressed respiration, and involuntary and almost inaudible expressions of pain, that he endured daily, extreme suffering from vesical tenesmus.

In April, 1867, he fell upon the pavement, and being unable to rise, was carried to his bed. No symptoms of fracture or dislocation could be discovered, yet he never afterwards walked; but after a time, was daily placed in a wheeled chair, and spent most of the day in his study, where he received his friends, and took part in the meetings of his club as usual.

For a few only, of his last days was he entirely confined to his bed; then his strength rapidly failed, and a drowsiness from which he was easily aroused, gradually deepened into coma, and without pain, he quietly ceased to breathe on the 27th of August, having just entered upon his ninety-fifth year.

I have mentioned more particularly the circumstances attending his last illness, if such it could be called, for they mark so accurately the decline of the vital power, uninfluenced by any recognizable organic disease. It was simply the gradual decay of old age.

Twenty-four hours after death, an autopsy was made by Dr. M. C. White, in presence of Dr. N. B. Ives and myself.

Of course great interest was felt respecting the appearances which the thoracic organs might present, as from the history of the case, considerable changes in the structure of the heart and lungs were to be expected. Rigor mortis very decided—body much emaciated.

On opening the thorax, only a moderate quantity, perhaps a *pint*, of serum was found in both cavities—the lungs were every where quite free from tubercular deposit, and in all respects healthy. In the apex of each lung, however, was found a dense, corrugated circular cicatrix, an inch and a half or more in diameter—also a *third* circular cicatrix, on the left side of the left lung, a few inches below the apex, each involving such a depth of tissue, as to indicate that the vomicæ of which they were the remains, had been large and of long duration. Both lungs were slightly adherent at the apex.

Here then, was all that remained to mark the beginning, progress and cure of a case of tubercular consumption, occupying *twelve years* in its period of activity, and with its incipient stage, dating back more than *three quarters of a century*. A legible record, surpassing in interest and importance to the human race, those of the slabs of Nineveh, or the Runic inscriptions.

The heart was of normal size, or a little less, and filled with very dark coagulated blood; its walls were thin, and its valves free from disease, the aortic valves holding water perfectly—the right auricle was dilated to the size of a duck's egg, the coronary arteries generally ossified, and the entire organ presenting the usual appearances attending Angina Pectoris, excepting the absence of hypertrophy.

The spleen was very much atrophied, and upon one side, forming nearly the entire bulk of what remained of it, was a steatomatous tumor, two inches and a half in diameter, hard and firm, looking like a mass of spermaceti.

The pancreas was healthy. The liver was small, and presented the appearance called "Nutmeg" liver, approaching in portions, the "hob-nail" variety.

The supra-renal capsules were almost obliterated. The kidneys were small, and each contained numerous urinary cysts, some as large as walnuts, while others were scarcely visible to the naked eye.

The bladder was also small, its walls thickened, and containing about two ounces of urine, which was not examined. Upon the left wall of the bladder, however, was a sac, open at the top, containing, perhaps, the most remarkable collection of urinary calculi ever seen in one individual.

It consisted of *nineteen loose stones* of the uric acid variety, weighing ten drachms and two scruples—and of such peculiar

shape as to suggest the idea that they had originally formed several larger calculi, which had undergone spontaneous separation in the bladder.

The integral sections present such a similarity of outline, and such singular uniformity in their faces, several of which have an angle of 120 degrees, that the conclusion is almost irresistible, that they were formed and separated in obedience to some mathematical law. An idea that I think will not fail to suggest itself, on examining the specimens themselves, or the accompanying engravings.

It is noticeable that in the two calculi that I have readily reconstructed, their separation was into fragments of seven around a central pillar. The commencement of this process of mathematical division is shown in Fig. A, and its completion is seen in Fig. B. Midway of the central pillar of this calculus, B, there is a horizontal disc-like nucleus, the rounded projecting edge of which was accurately fitted into corresponding depressions in the internal facets of the sections forming the original stone.

The outline of what was once, doubtless, a similar horizontal nucleus, is distinctly shown midway in the central pillar of the other calculus, Fig. 5; but now worn down to a level with the general surface.

After reproducing these two calculi, A and B, from the accurately fitting sections, there remained eight pieces having the same general outline as the others, with the same central depression upon their internal angles, showing that originally, they were the component parts of a third calculus, having the same arrangement of seven sections around a central pillar; but they are too much worn by long attrition, to be re-assembled.

Figures 1, 2, 3 and 4, are segments of the calculus, re-united at B.

Figures 5, 6, 7, 8, 9, 10, 11, are segments of the calculus which I have re-united at A.

The remaining figures, are those of the stones that could not be united. One fragment, not here shown, was used by Prof. G. F. Barker for analysis.

The spontaneous separation of urinary calculi, within the bladder, is a phenomenon which has not been frequently recorded, although instances of their disintegration and passage from the bladder in fragments more or less comminuted in the form of sand, or of angular pieces of considerable size, have been occasionally observed from a very early period, and probably led to the ancient practice of attempting their chemical solution by medicating the urine through substances introduced by the stomach, or injected directly into the bladder—and we are doubtless indebted to the observation of spontaneous separation, or disintegration of urinary calculi, for the substitution of the now common operation of lithotripsy instead of lithotomy.

In "Jenaische Zeitschrift für Medicin und Naturwissenschaft," Leipzig, July, 1868, is an extended article on this subject, by Dr. Julius Geinitz, who in mentioning the early observations that have been recorded, says that he has collected from the literature of the subject, fifty-two cases, giving authorities and dates ranging from 1685 to 1864. A case was also reported to the British Medical Association in 1867—and from the great rarity of such specimens in the largest collections of calculi of which we have any knowledge, it must be inferred that their occurrence is very infrequent.

By what mathematical or chemical law, were these calculi spontaneously separated in a manner so peculiar?

Had the laws of crystallization anything to do with their formation or separation?

Were strie of animal matter interspersed throughout their structure during the formative process, and which by some change in the chemical reaction of the urine were dissolved out, allowing the mass to fall asunder?

Were they broken by external force applied to them through concussion, as in walking or leaping? are questions which naturally suggest themselves.

Spontaneous separation has been attributed to each of these causes; it has also been referred by Geinitz to the operation of chemical action of another kind. He says, when any single layer of the stone is converted into a compound that occupies a greater volume than it did previously, the more external layers may easily be split off. Thus in case of the uric acid calculus, he supposes that the urine having become more strongly alkaline, percolates through the outer layers, and acting upon the uric acid nucleus,

converts it into urate of ammonia, the volume of which being much greater than that of uric acid, a force is generated, which, acting from within outwards, disrupts the calculus. So many forcible objections to this ingenious theory of spontaneous separation present themselves, that it must be classed with the others alluded to which are all unsatisfactory, and the problem remains unsolved.

In reflecting upon the sacculated relations of this calculous quarry, and the high lateral position of the sac, it seems probable that their presence could not have been discovered by exploration with the metallic sound, although many of the symptoms of urinary calculus were present.

Ferguson, speaking of lithrotrity, says, "should the bladder be saculated, a condition which can scarcely be ascertained on the living subject, the difficulties would be greatly increased." He says further, that "a large pouch sufficient to conceal a calculus of large size, is exceedingly rare."

It is hardly too much to say, then, that the presence of these calculi could not have been detected during life.

A writer in Holmes' recent work on Surgery, speaking of the same source of difficulty and error in the diagnosis of urinary calculi, says, "it is quite uncommon." He mentions the case of a man in whom Morand had discovered a calculus by the sound, but which could not afterwards be recognized by other surgeons. At his death, years afterwards, the patient willed his body to Morand, as he said, "to teach him a lesson." On post-mortem examination, however, there were found "three calculi, as large as apricots, saculated on the side of the bladder."

The reflected light which this remarkable case throws upon the status of practical medicine, as it existed in the last century, invests it with peculiar interest. It was a connecting link between the old dynasty and the new—a surviving witness of a wonderful revolution in the opinions of men, second only in magnitude and importance to that which ushered in the Christian era.

Holding on in blind faith, to the bloody vestments of the past with one hand, it reached eagerly forward to welcome the dawn of Rational Therapeutics with the other; and was doubtless regarded at the time, as strongly sustaining the truth of the new doctrine which was then just beginning to make its way among the profession, and which soon after divided it into two hostile parties. The one holding the long undisputed dogma, that all disease was *sthenic* in its nature, and was only to be cured by *bloodletting and calomel;*

while the other contended as stoutly, that disease was *asthenic* in essence and only to be cured by *stimulants* and *tonics*.

Few of us know anything except from history or tradition, of the fierce war that for a whole generation raged among the doctors. It was literally "war to the knife," and was marked by gross personalities and bitterness. But the phlebotomists were driven from the field; and where at that time, a *thousand* patients were bled, not one is bled to day, and yet the sick recover as promptly, and the value of human life has steadily increased.

As a general rule, perfect unity of opinion is incompatible with permanent scientific progress. Mindful of this fact, the profession, true to its own traditional character for disagreement, while it has been reluctantly compelled to yield its unanimous assent to the opinions and practice of the conservative school, is again widely divided in opinion as to the causes that have produced this great revolution in practice.

One party, of which Dr. Stokes, of Dublin, may be called the representative, arguing that venesection and cathartics are not as well borne as formerly, because of the great change that has been silently progressing in the *diathesis of disease*, consequent upon changes in the *habits and constitution of the population*, incident to increased wealth and greater diversity of occupations, as well as changes in the character of the seasons and the topography of the country, from the destruction of forests and construction of public works, and other causes. The other party, represented by Professor Bennett of Edinburg, affirm that the disuse of blood-letting is wholly due to the prevalence of the new and improved views of therapeutics, as promulgated by himself and others, and based upon the more intelligent study of pathological anatomy. Undoubtedly the opinions of each school are in the main correct.

Until within a few years, the possibility of a *natural cure* of tubercular consumption, after it had reached the stage of suppuration and the formation of vomicæ, was denied. The frequent discovery, however, after death, of cicatrices in the lungs, and of dry and empty cavities, communicating with the bronchi of living persons, who, during former years, had presented all the physical signs of consumption, leaves no room to doubt that such favorable terminations, are much more frequent than is even yet supposed.

ARTICLE VII.

RELATION OF ALBUMINURIA TO PUERPERAL CONVULSIONS.

BY P. M. HASTINGS, M. D., OF HARTFORD.

Read before the Hartford County Meeting, April 30, 1861.

The relation as cause and effect, which recent investigations have proved to exist between Bright's disease of the kidney and puerperal convulsions, forms a subject of very great interest. In the present state of our knowledge, it would perhaps be premature to assert, as some eminent writers have done, that all cases of true eclampsia are due to diseased kidneys, since equally careful observers have failed of finding evidences of any pathological change in these organs, in fatal cases of puerperal convulsions. Yet the accumulation of instances where fatal eclampsia has attended the various forms of Bright's disease together with a large number of cases in which recovery took place, and which presented conclusive evidence of similar pathological changes, warrant the claim, that a large proportion of puerperal convulsions arise from diseased kidneys.

The term Uræmia, denoting that condition of the blood, arising from the retention of urea, one of the principal constituents of the urine, comprises a class of symptoms long recognized as produced by the retention or suppression of the urinary secretion, is now applied to Bright's disease. Repeated experiments with varying results, still leave the question, whether urea or carbonate of ammonia into which it is readily converted, really acts as poison when introduced into the circulation, undecided. So that we must understand by the term uræmia, that condition of the system arising

from the toxic influence of any or all the constituents of the urine retained in the blood.

The term albuminuria often used as nearly or quite synonymous with uræmia, seems on many accounts the most appropriate. The presence of albumen in the urine is one of the most constant symptoms of Bright's disease, especially if accompanied by casts of the uriniferous tubes or fibrinous clots, furnishes the most reliable and sometimes the only evidence we can have in forming a diagnosis. It is a test easily applied and in a large proportion of cases, is a symptom of greatest value. The presence of albumen in the urine may not necessarily be a symptom of grave disease, as its existence may depend upon causes of a temporary nature; and on the other hand, cases of Bright's disease, are on record where careful observation has failed to detect uriniferous casts or albumen in the urine. Still albuminuria is to be regarded as the prominent symptom of this disease, even when associated with a considerable amount of urea.

It will occur to the mind of every medical man, that the relation of albuminuria to the puerperal condition is difficult to define, and in the present state of our knowledge, exact conclusions are far from being received without question.

In private practice, a large majority of cases of eclampsia do not fall under the notice of the physician until too late to make careful inquiry as to the cause and when prompt and efficient treatment must absorb his whole attention. And to this circumstance, we may add the statement, that Bright's disease has been found in fatal eclampsia, where its existence had not been suspected, and where even the ordinary symptoms were known to be absent. It seems now to be well established, that albumen is sometimes intermittent in its appearance. Repeated observations may be necessary for its detection. Sometimes very close discriminating study will be required to separate those symptoms due to diseased kidney, from those arising from the development of the uterus.

Our knowledge upon these points must depend largely upon the observations made and recorded in lying-in-hospitals, where the only opportunity of studying considerable numbers of cases presents itself. I believe, however, that very many of the troublesome, and sometimes fatal concomitants of the puerperal state will be found to depend upon disease of the kidneys.

The causes of Bright's disease seem to be little understood. Since ligating the renal veins in animals has produced albuminuria,

it has been inferred that pressure upon these vessels by the gravid uterus preventing the return of the blood, was one of the principal causes of congestal kidney; but as albuminuria may and does occur at any period of the puerperal state, in the earlier months of pregnancy, as well as after delivery when such pressure cannot be supposed to exist, producing abortion and convulsions—still farther, we find large uterine and ovarian tumors, where pressure upon the kidneys may be presumed to exceed that of the gravid uterus at full term, often free from this complication, we may well doubt the efficiency of this course. The peculiar condition of the blood in pregnancy, the increase of water and fibrin, with large numbers of colorless corpuscles, the decrease of albumen and red globules, is supposed in some manner to favor congestion of the kidneys. Probably, in many cases, both of these conditions tend to induce congestion and the subsequent changes which have been included under the term Bright's disease. It seems plausible to suppose that the blood, poisoned by arrest of the urinary secretion, circulating in the nervous system, induces an irritable condition of the nerves, which needs but the exciting influence of labor, to produce convulsions or other known effects of uræmic intoxication.

Eclampsia is much more frequently observed in primiparæ and is seldom witnessed in subsequent pregnancies. In those rare instances where it has been repeated, there are strong reasons for suspecting chronic disease of the kidneys.

Undoubtedly, very different degrees of susceptibility to this species of toxæmia exist. A comparatively moderate amount in some instances inducing fatal convulsions, while in others, where the evidence of an advanced stage of Bright's disease is unquestionable, we may fail to notice any evidence of uræmic intoxication. It is stated as the result of extended observation, that eclampsia rarely happens, where extensive effusions in the cellular substance of the extremities is noticed. Illustrative of this extreme insusceptibility and its opposite, I will briefly state two cases, notes of which were preserved, which came under my care in 1864.

June 12th. I was called on account of dropsical trouble to see Mrs. A, a small, feeble looking woman aged about 45 years, multipara, three days before the commencement of labor. Found her lying upon the abdomen with the legs extended to their utmost limits, and claiming that in this position only, can she secure any rest. The external labia were enormously distended, firm and dense, not in appearance unlike a large double hydrocele. Abdomen very large, and

presenting distinct evidence of fluctuation, the upper and lower extremities very œdematous, face pale puffy. Expects to be confined in a week or two. Urine said to be very scanty. Directed compound Jalap powder in drachm doses to be repeated every two hours until a decided effect was produced.

13th, Cathartic operated freely, urine still reported very scanty and none could be procured for examination. Directed a diuretic mixture of wine of Colchicum, Digitalis and Hyoscyamus.

14th. About one pint of urine had been collected in twenty-four hours. Bowels much relaxed. Abdomen and labia much less dense but not very much reduced in size. Examination of urine, sp. gr. 1020. Albumen very copious, fine cells and uriniferous waxy casts very abundant.

15th. Labor commenced at 3 o'clock A. M., on rupture of the membranes an immense discharge of liquor amnii occurred, followed by the delivery of a healthy child and another flood of water.

16th. Patient very comfortable lying upon her back, with legs widely distended, says that she has passed urine freely.

19th. Found patient sitting up in an adjoining room, reports herself as feeling quite well. Urine contains albumen and pus in small quantities. Directed the Jalap powder to be repeated every second or third day.

Saw this patient at the end of the third week, and found her engaged with her ordinary household duties. The dropsical effusion had entirely disappeared, and to all appearance she was in ordinary health.

It would be a fair inference that this woman had large white kidneys, that the extensive effusion and free purgation, joined perhaps with a more than ordinary insusceptibility, preserved her from the more formidable symptoms of uræmic intoxication.

In contrast with this case, I will adduce another instance where the amount of retained urea must have been very slight.

Mrs. N. a primipara was taken within labor on the morning of November 11th, 1864, several hours before my arrival. Found the os uteri fully dilated, head presenting, pains moderate but efficient.

On inquiry, learned that her pregnancy had not been attended with any unusual symptoms, except that for a few days previous she had suffered from severe pain in the head, differing in character from any before experienced. I thought her face appeared puffy, but her friends had noticed no unusual fullness. Urine said to be

free and natural as to quantity. After the labor had gone on favorably for five or six hours, and when the head was pressing upon a somewhat rigid perinæum, she was seized with a severe epileptiform convulsion. Delivery was speedily effected by instrumental aid—the child was large and healthy.

The mother remained comatose several hours, when accused complained of headache—ordered five grains of Dover's powder to be repeated in two hours. In the evening found her still complaining of headache, no return of convulsions, pulse small and quick.

18th. Passed a restless night, still complains of severe pain in the head. Has passed urine twice during the night. I secured a small amount for examination. This was decidedly albuminous, accompanied with a considerable amount of epithelium, no casts observed. Directed the compound Jalap powder, to be repeated in two hours. In the evening found patient much relieved by operation of cathartic. Very little pain of head—repeat Dover's powders.

19th. Slept considerable, pain in the head has returned, but less severely, pulse small and quick, repeat cathartic.

20th. Much relieved by the purgative, slept a greater part of the night. No untoward symptoms presented themselves during convalescence. The urine contained no trace of albumen after a few days.

This, I presume, was an instance of simply congested kidney, and owing to the peculiar susceptibility of the patient, was followed by a severe convulsion.

During the same year, I saw in consultation Mrs. G., primipara—a large scotch woman, aged 39 years. The attending physician saw her in the morning,—very little progress in labor. She complained of severe and peculiar pain in the head. She was bled largely without much relief to the headache. In the afternoon she had a severe convulsion which was repeated three times with short intervals. During the last convulsion a dead child was expelled. I arrived about half an hour after delivery and found the patient breathing stertorously, could not be aroused, pulse slow and full, face much swollen, as were also the lower extremities, bowels constipated, urine said to have been copious. Examination of this fluid, revealed a large amount of albumen and great quantities of waxy casts. Castor oil was administered freely, and its operation was followed by a marked amelioration of the coma. Three days after, I found there had been no return of convulsions, patient still

comatose, but can be aroused sufficiently to answer questions. Advised occasional doses of the jalap powder, with a moderate amount of stimulants. This patient had a tedious convalescence, and after an interval of three months was pale and face was somewhat swollen.

I regard this case as an example of the large white kidney, from which complete recovery was delayed for several months.

I give the particulars of another case, in which disease of the kidney was well marked but was not attended with convulsions.

November 20th, 1864, saw in consultation, Mrs. D., aged about forty years, the mother of several children. I learned that after several days of moderate pains, she had been delivered two days previously, of a dead child at about the sixth month of gestation. Since delivery, she had been very restless, complained of severe pain in bowels, distress of stomach and constant vomiting. Pulse 120, small and quick, tongue heavily coated, abdomen much enlarged, hard and presenting distinct fluctuation, very little edema observable, says she cannot sleep on account of severe pain in the lower part of the bowels. She has been constipated for some time, does not know when she passed urine, has a constant desire to micturate, but all efforts thus far have been unsuccessful. The attending physician regarding the case as one of puerperal peritonitis, had directed fomentations to the bowels and administered opium in two grain doses every two hours, without affording any relief. This course had been pursued twenty-four hours without inducing sleep. The patient states that she had not slept since the birth of the child. A catheter was introduced, and about an ounce of urine drawn off, without, however, affording any relief to the desire to micturate. Regarding the case as one of uræmic intoxication, I advised the discontinuance of the opium, and that croton oil should be given until free purgation had been secured.

December 1st. Urine examined; heat and nitric acid converted almost the whole mass into a jelly, composed of albumen. Casts were abundant. Found patient much relieved by the operation of oil—slept some during the night—pulse slower, small and feeble—abdomen very much enlarged, somewhat tender, with decided fluctuation—vomiting had almost entirely ceased. Advised a diuretic medicine of wine of colchicum and tincture of digitalis.

Saw this patient again, after the lapse of about a week, and found her much improved, but unable to take food—pulse rapid and small—tongue red and dry, and with quite a large quantity of

fluid in the peritoneal sac. Advised full and frequently repeated doses of the jalap powder. I learned afterward, from the attending physician, that this woman was much relieved by the free purgation following the powder; that urine gradually increased in quantity, and that convalescence, though slow, was attended with no unpleasant symptoms. After some months, I found her restored to her ordinary health.

As may be inferred from the foregoing cases, that the treatment of puerperal convulsions must depend largely upon the prompt and efficient administration of drastic cathartics. Little confidence, in my opinion, can be placed in the action of diuretics, the kidneys being in no condition to respond to the action of this class of stimulants. Purgations are generally well borne, and marked relief from the kind of toxæmia under consideration, is pretty certain to follow their operation. The compound jalap powder, I think, is one of the best remedies of this class we possess. Its bulk and nauseous taste are serious objections to its frequent administration; the addition of ginger, or the leaves of the spearmint, will sometimes obviate this difficulty.

Where the occurrence of eclampsia, as is frequently the case, marks our first introduction to the patient, the treatment must be entered upon promptly and efficiently. Removal of the child, when it can be effected readily, and without too much violence, is our first duty.

Venesection, free and often repeated, if the convulsions were continued, was the rule laid down by writers for a long period. If the patient is plethoric, bleeding may prove of great service. But in a large proportion of cases falling under my observation, I should regard the practice as decidedly injurious, tending to prolong convalescence. In the anæmic this practice is certainly inadmissible.

The free use of chloroform is unquestionably the most important improvement in the treatment of eclampsia of modern times. Its administration enables us to control effectually the convulsions, and gives opportunity for the use of other means designed to remove the cause. Its prompt and sustained effect, I believe, has never been followed by serious results. In serous effusion, or true apoplexy, it will, I think, fail of arresting the convulsions. Its use, however, may be of great service in forming a correct diagnosis.

Croton oil, being easily administered and rapid in its action, is our most reliable agent, under the circumstances, in removing the

cause of eclampsia. Its action can be assisted by the use of stimulating enemata. After free purgation has been secured, the free use of opium, combined in some cases with colchicum, will prove of great value.

Bromide of potassium has recently been recommended as a valuable remedy. I have no doubt, in those cases where opiates are not well borne, this will prove of great benefit.

I have thus briefly stated, what seem to me to be the principal indications in the treatment of albuminuria, in its relations to the puerperal condition. Other remedies will undoubtedly occur to the minds of those present, which perhaps are more valuable than those mentioned. My own experience has led me to rely mainly upon the active and free use of the articles above alluded to.

ARTICLE VIII.

CASE OF ICHTHYOSIS SAURIDERMA SPINOSUM.

(Added to the Synopsis, May 20th, 1865.)

BY HENRY PIERPONT, M. D., OF NEW HAVEN.

The patient, M. S., a girl 10 years of age came under my observation in April last, affected with Ichthyosis, so extensive and remarkable that I have thought it of sufficient interest to present to the consideration of the profession. It being of unusual interest by reason of the extent of the disease as well as the length of the spines, the longest of which are on the knees, elbows and thighs and strongly represent the porcupine appearances. On the knees, the spines measure full three-eighths of an inch in length, one-fourth in breadth, and one-eighth to three-sixteenths in thickness. On the legs and dorsal portion of the feet, the spines are broad and flat, resembling a very thick scale. On the body they are firm and elevated about a sixteenth of an inch, not uniform; some patches very dense and others sparse.

It extends over the legs, arms and greater portion of the body. The surface over the spinal column upwards, from the lower dorsal vertebra, and about the upper three fifths of the chest anteriorly are unaffected, except that the nipples and axillary portion of the pectoral muscles and shoulders are covered, the former thickly, and the fingers, from the knuckles down, are free from the spines. The palms of the hands, soles of the feet (as is usual), are also free.

She is in good health otherwise, and suffers only in cold weather from the cracking of the skin between the spines, causing stiffness and soreness, making flexion and extension of the limbs painful, impairing her ability for walking or getting about.

Previous to my first visit, the patient's mother stated that her child had a slight roughness of the skin, the *truth* of which the accompanying plate will illustrate. This will also account for my

not being able to obtain a more full and reliable history of the case previous to her coming under my observation. The mother says that while carrying the child, she had excessive longings for apples and sour milk; and that while in an orchard for the former, she saw the head of a snake in the grass, looking at, and running out its tongue towards her, which frightened her dreadfully, and thus caused the child to be marked. [How seeing the head of a snake should be instrumental in causing a disease of the sebaceous follicles of the skin, is not easily explained to the mind of the writer].

From earliest infancy, there was roughness, which was increased by the application of cold water. At five months old she had a severe attack of jaundice, the entire skin becoming very yellow, which the mother alleges was cured by the administration of three pedicali, three mornings in succession, and the greatest care enjoined that the pedicali must be taken from a stranger. (I suppose a homœopathic remedy, as I have never heard of any other practice using them as a medicinal remedy internally). And that soon after the recovery from the jaundice (whether one or six months, am unable to learn), the ichthyosis commenced on the knees, and was some four years in extending over the legs and thighs, continuing upwards upon the body, on the latter slowly until the past year, since which it has spread rapidly.

Commenced treatment early in June, and some days after the spines began dropping off, whether from the effects of the treatment or wholly from the nature of the disease, I am unable to say; as she has usually shed them in warm weather, to some extent. Though the mother says the skin has never been as smooth when the spines have dropped off before.

July 15th, at time of going to press, the knees and greater portion of of the thighs are clean. It is also cleaning off from the elbows. Am unable to learn of its being in the family before. I have reason to believe that both parents were intemperate.

ARTICLE IX.

TRUAMATIC LESION OF THE KNEE JOINT.

Reported at the New London County Society, April, 1869.

BY E. FRANKLIN COATES, M. D.

By permission I will introduce a case of special interest to every practitioner of medicine as well as to the professed surgeon.

February 12th, 1866, I was called to see a young man aged twenty-five years who had been a soldier in the 21st Regiment Conn. Vol. While in battle at the taking of Fort Harrison, (Chapin's Farm), Va., Sept. 28th, 1864, he was wounded in the upper part of the tibia of the right leg by a shell which rendered him unfit for service for four months. From this injury he had perfectly recovered, but with an escar of the size of two by three inches. He had been discharged from the army in June, 1865. I found him with another wound near the first. He had been an employee in a saw-mill connected with a ship yard, and while engaged with others in rolling a ship-knee upon the bed of the mill to be sawed, the assistant let go his hold, and in the rolling fall of the timber, his full flexed knee was caught between the timber above, and the bed of the mill below.

The edge of the saw mill bed was covered with heavy iron plate, and the timber striking on the lower part of the femur, brought the upper part of the tibia against the iron plate with such violence as to tear through its external covering, split off its upper part and open into the knee joint, in fact, cutting the leg at the knee half through. It had also wounded the femur, removing a piece from the spongy texture of the condyee of the size of a large filbert.

This was his condition when I found him two hours after the accident. I turned up the patella with its ligament attached to the broken fragment of the tibia, and with the knee half flexed I could see two-thirds of the articular surface of both bones that form the joint. I considered what it was best to do. Amputation was the rule. The young man was poor, without friends that were able and willing to support him, and he then temperate and healthy. Amputation above the joint was not wholly free from danger, and I concluded that as he was dependant upon himself for support, that it was best to wait and see what could be done before advising its removal. I dissected away the fragments of bone and brought the parts together and secured them first by five sutures. Then I applied a long strips of adhesive plaster between the stitches and secured them well. By appropriate bandaging, the parts were managed so as to be kept together for three days. Then I removed the plasters and re-applied only one long strap where the wound gaped the most, leaving the remainder secured only by the sutures, (about one and a half inches apart) so as to allow the free escape of all puriform secretions. The single adhesive strap was re-applied daily over the part which presented the greatest opening until ulceration forced the stitches to give up their hold. Then more straps were applied, but never in sufficient number to interfere in the least, with the free escape of matter.

The leg was supported on Liston's double inclined plane, without any bandage that could in the least interfere with the free circulation of the blood. All progressed well for ten days, when the leg somehow got moved on the edge of the splint while the patient was asleep so as slightly to twist the knee. This seemed to be the commencement of a new inflammation. The knee swelled badly. I ordered tepid water, weak spirit lotions, charcoal and yeast poultices; and in four or five days, a small quantity of thick pus had formed each side of the joint, which was let out with a lancet. At about this time, I was truly sorry I had not advised amputation at the first. I had not had council in the case, but in two or three days more before the daily round to my patient, I determined to advise a neighboring surgeon to be called, to consult regarding amputation, even then more than two weeks after the accident, being liable to censure because the leg was not removed at the first. But on seeing the case, hope comforted me; the inflammation was evidently subsiding. From this time with persevering efforts, the case progressed favorably, so that in two weeks more, the inflam-

mation was gone, the wound had healed and I was willing to show my patient to any one who was not afraid to look at the scar.

I kept the leg slightly flexed upon the splint for nearly another month, when I unexpectedly found some motion at the joint. It was then moved each day as much as possible without giving so much pain as to endanger inflammation, and the persevering efforts finally resulted in the perfect use of the joint. He was confined to the house about three months, getting out at first upon crutches. In six months he had abandoned all support except one cane, and in one year this was also laid aside. In eight months more, he had been known to walk six miles at one time without serious inconvenience.

This may be called bold or timid surgery in trying to save the leg, but I was actuated by no other than the scripture rule "do unto others as ye would have them do to you in like circumstances," and the result is favorable. If I had been governed by hospital experience either civil or military, this young man (if he had lived) would now be enjoying an artificial pedestal, instead of the leg which his Creator gave him, and which is now preserved for his use. In private practice we do not have so much gangrene to fear as in the hospital, and may often "hope on in the former, where hope would be lost in the latter."

This wound has not given him much trouble since it healed, but slight necrosis has attacked the bone at the wound which he previously received at Fort Harrison in 1864, and an ulcer now takes the place of the scar and gives him some trouble.

In the progress of a case it is often easier to say what should have been done than what is to be done, for effects apparent when they come, are not always so apparent before hand, and often in trying to save a limb, we are obliged to risk the life, and, if the case prove fatal, subject ourselves to censure. The great business of the surgeon is to save both life and limb if possible, and the lesson of this case is worthy of our serious study, for in it, the powers of nature are not only shown, but also the action of the remedial agents useful to insure safe results.

MEMOIR OF

DATUS WILLIAMS, M. D.

Read before the Convention May 25th, 1868.

BY E. E. SYE, M.D.

Datus Williams, M. D., the subject of this sketch, was born in the town of Norwich, Conn., Feb. 25, 1793. He was one of nine children, being a descendant in the seventh generation from Robert Williams, of Roxbury, Mass.

He was the son of a farmer, and in early life enjoyed such educational privileges as were usually accorded to youths similarly circumstanced at that time; that is, the privilege of attending the district school in the winter, the rest of the year working on the farm. While thus employed in assisting his father on the farm pertaining to what is known as the Bacon Academy, in Colchester, Conn., he seems to have formed the purpose to prepare himself for the practice of medicine. With no resources but his own exertions, which would, to many, have offered insurmountable obstacles to the accomplishment of such a purpose, we find him soon after teaching school in New Jersey. While thus engaged in supplying himself with the necessary means, he devoted himself to reading and study, preparatory to that of medicine, and in the year 1820 became a pupil of the late Dr. Osgood of Lebanon, and subsequently of Dr. Cogswell of Hartford, Conn.

He attended Lectures at the Yale Medical School, and while there was a chum of the late Professor Charles Hooker. He received a license to practice, from Yale College, in 1823, and the same year commenced practice in that part of East Haddam known as Millington. In 1824 he married Miss Clarissa M. Peck, of that place. He continued in M. until 1835, when a vacancy occurring in the western and more populous portion of the town, he moved thither, where he continued in active and successful practice, except when prevented by ill health, up to the time of his death, which occurred Nov. 4, 1867, in the seventy-fifth year of his age. For two years previously he had suffered severely from rheuma-

tion, as well as from asthma, a disease to which his family has always been subject, but on the morning of his death he had seemed to be better than for some days before. A few minutes after having passed into the yard, he was discovered by his wife lying upon the ground, as she supposed, in a fit. Dr. H. E. Williams, a son of the deceased, who was at home at the time, writes—"I immediately ran to him, and raised him, but life was already extinct,—he having died evidently without a struggle, though yet rigid in apparently the spasm of an apoplectic fit." As to the immediate cause of death, he suggests further, "either metastatic rheumatism, or, perhaps, valvular ossification."

Thus suddenly has passed from the stage of life, another of our number. He leaves two sons, and a widow in feeble health; thus bereft of the partner of her joys and sorrows, to complete the journey of life. The elder son graduated at the N. Y. University Medical College, in 1847, and practiced his profession in the city of New York until 1864, when he entered the service of his country as Ass't. Surgeon of Volunteers. He is now in impaired health, from diseases contracted while in the service. The younger son has been for some years connected with, and is at present an officer in one of the N. Y. City Banks. A third, and the youngest child, a son, died in infancy.

In the death of Dr. Williams, a vacancy has been created in our ranks, and in community, which cannot be readily filled. He possessed some qualities which constitute the good physician, in more than a common degree. At the bedside of the sick he was calm, self-possessed, cheerful, hopeful, and so benefitted his patients by inspiring them with hope, as well as by his prescriptions. If in diseases of a mild type he trusted more than some to the *vis medicatrix naturæ*, he had good authority for doing so; while he was prompt and not sparing with potent remedies, in cases demanding their use. Practising in a region of rough and hilly roads, a considerable portion of it but sparsely populated, and frequently called upon long and fatiguing rides, very few, it is believed, have more promptly or faithfully responded to the summons of the sick, undeterred by storm, darkness, or little prospect of other compensation than a consciousness of having ministered to the relief of suffering humanity. Imbued with much of the *esprit de corps*, he was jealous of the honor of the profession, and showed little favor to quacks and their abettors. He usually attended and enjoyed meetings of his professional brethren. By a recommenda-

tion of the Connecticut Medical Society, he received the honorary degree of Doctor of Medicine, from Yale College, in 1843. In 1853, he represented the Middlesex County Medical Society, at a meeting of the American Medical Association, and repeatedly attended the State Convention in the same capacity. He appreciated and improved the privileges of citizenship, and faithfully discharged its duties. He took an interest in whatever pertained to human progress, whether local or general, and kept himself posted therein. In the family and social circle he was uniformly kind, social and genial.

Dr. Williams, moreover, thought and acted with reference to the future as well as the present life. In 1839, he became, and continued to the time of his death, a communicant of the First Congregational Church in East Haddam.

From the intimate and confidential relations usually existing between the physician and the families he enters, and from the nearly half century that the Doctor had practiced in substantially the same field, it was to have been expected that his death would be the severance of ties both numerous and tender. That this was so, was evinced in many ways, as well as by the large concourse of sincere mourners who gathered around his grave.

BIOGRAPHICAL SKETCH OF

FRANK N. H. YOUNG, M. D.

Dr. Young was born in Clifton, England, August, 1831. His father was a Surgeon in the British army, and was with the Duke of Wellington in his campaigns. From childhood, he (the son) was a great reader, insatiable in his desire for books; and so retentive was his memory, that he rarely forgot anything which he had read. Fond of the languages, he is reputed to have mastered Xenophon when but ten years old, reading it with his mother.

He seemed to inherit from his father a love for the study of Medicine; but his father's early death changed the course of his life. Through the influence of Dr. Locock, a friend of the family, he obtained a position in the Navy, was graduated at Portsmouth Naval College, and entered into active service. While thus engaged, he visited nearly every part of the world. His last voyage was to the Arctic Seas, having joined an expedition in search of Sir John Franklin. On his return he gave up his commission and left the Navy.

Having decided to study Medicine, with the intention of becoming a Medical Missionary, various circumstances led him to qualify himself in the United States. He graduated at the Berkshire Medical Institution, Pittsfield, in the year 1858, where he continued, as Demonstrator of Anatomy, till 1860.

In June, 1860, Dr. Young accepted, from the American Board of Missions, an appointment as Physician to the Nestorian Mission, Oroomiah, Persia. While there, he was engaged in an extensive and very laborious practice, but found time for much Missionary work, and sundry literary undertakings. He learned several languages, translated parts of the Bible for the Americans of Persia, wrote a work on Hygiene, for use in the Seminary at Oroomiah, and another very useful one on nursing. He also instructed a young Persian in Medicine, and sent him to this country to be further educated.

At the end of three years, these severe labors proved too much

for his shattered constitution. A hemorrhage from the lungs left him so feeble, that he was obliged unwillingly to give up his Missionary work. On his way home, he spent some time in professional study in the cities of Europe, principally in Vienna, London and Paris.

In February, 1843, Dr. Young commenced practice in Danbury, Fairfield Co., and soon became a member of the Connecticut Medical Society. Though his health improved, he was yet obliged to contend (as he did with wonderful resolution) against feebleness and disease. He loved his profession, and was untiring in his devotion to it.

In the fall of 1867, he consulted two physicians of New York. They confirmed his apprehensions, and his disease at that time was pronounced Albuminuria. He spoke of it to no one, but continued his practice till two months before his death. About one month previous to this event, he asked the advice of a physician of Danbury, (where he last practiced,) and complained of "blindness, accompanied by great dilatation of the pupil, headache, restlessness, etc." He was at first supposed to have taken belladonna, by mistake for hyoscyamus, the last of which he was accustomed to use for his severe headaches. After a day or two, the diagnosis was corrected, and the patient admitted that he had Albuminuria. Subsequently, he partially recovered his eyesight, but continued to fail, and died in convulsions, March 17, 1868. He was buried in Pittsfield, Mass.

The professional friend, just referred to, writes of Dr. Young as follows:—"He was a skillful physician, well versed in the science of his profession, honorable in his intercourse with his brethren, strictly conscientious in the discharge of his duties to his profession, and a gentleman."

BIOGRAPHICAL SKETCH OF

S. P. V. R. TEN BROECK, M. D.

BY GEORGE L. REES, M. D.

S. P. V. R. Ten Broeck was born Dec. 21, 1802. He studied Medicine with J. Watts, M. D., of New York, graduated at the College of Physicians and Surgeons, in 1825, and engaged for several years in hospital, dispensary and private practice. Afterwards he settled in Fairfield, Conn., where he continued to practice until Aug. 1st, 1866, when he died, of chronic rheumatism and neuralgia. Although Dr. Ten Broeck had been a great sufferer for four years, it was hoped that on the opening of summer his health would improve. He was lively and cheerful, hopeful of himself, had less pain, his appetite improved, and he could ride more easily. He soon found, however, that his physical strength was failing. Nausea set in, so that for days nothing was retained upon his stomach.

About four weeks before his death he had a severe attack of his old complaint, and he thought he was dying; but he rallied, and spoke of his approach to death with calmness and resignation to the will of God. For a few days he seemed better, and enjoyed the society of his friends. On Wednesday before his death he was worse, and when physicians were called he was beyond the reach of human aid. At 2 o'clock, Aug. 1, 1866, without a struggle, his spirit returned to God who gave it.

He was a gentleman, in the noblest sense of the word; modest, yet gifted with high abilities; generous to a fault; steadfast in his attachment to friends, and true to his Church. Few have more deeply mourned over his faults than himself.

His funeral was largely attended, at the Episcopal Church, by the community, who appreciated his worth as a skillful physician, a true gentleman, and a sincere Christian. It was a touching sight, as the crowds of the poor, whom he had aided in sickness or want, on passing his coffin, one by one, bent low and kissed the hand which could aid them no more.

MEDICAL COMMUNICATIONS.

ARTICLE X.

PRACTICAL OBSERVATIONS ON THE ABUSE OF TOBACCO,

AND ITS CONSEQUENCES ON HEALTH.

Being the Annual Address delivered before the Convention, May 30th, 1860.

By the President of the Society,

S. B. SHERWOOD, M.D., OF HARTFORD.

Mr. President and Gentlemen, Members of the Medical Society:

In compliance with the customary rule of our State Medical Organization, the duty of delivering the expected annual address, on the present occasion, devolves on me. With your permission, I propose this evening to briefly review the history of tobacco, to examine its analysis in the leaf and smoke, to consider its effects on our organism in the induction of disordered health; and to respectfully inquire, if the constant abuse of the plant does not originate oftener than suspected, difficulties exceeding the limits of strict functional disturbance.

Such inquiries naturally and properly fall within the scope of medical investigation, therefore we may legitimately discuss them here; and if by any possibility, in the present condition of existing social peculiarities, the excessive employment of tobacco can be restrained by proper appeals to the good judgment, moral sense, and fears of those unduly indulging in it—such desirable results, will I venture to predict, be obtained more readily and directly, through the influence and discreet exertions of the members of our own profession, than all other agencies combined; an opinion, if based on truth, of serious importance and responsibility to each of us.

The tobacco question has always, in most parts of the civilized world at least, been a vexed one; and wide differences of sentiment have ever surrounded it. Many honestly regarding, especially more recently, its moderate use as salutary, as an inestimable comfort and assistant in brain work, "as retarding waste, facilitating repair, alleviating abnormal sleeplessness and tremor," and as thus warranted by sound physiological deductions.

Others, equally experienced, and competent to judge, whose opinions are in every way entitled to respectful attention, have regarded it, and do consider it, as an offensive habit, a needless and unwarrantable expense, a frequent source of dissipation and disease, and in general a trying evil, to be dreaded in the present, more in the future, and as conferring no very special benefits, not attainable by less objectionable means.

I entertain, however, no ambition or desire to enter here, on any moral crusade against tobacco: the occasion forbids this, and duty certainly does not demand it; and I propose confining myself as closely as practicable to the proposition stated.

In the progress of this paper, I shall candidly express such opinions as I may deem right; and offer some reasons, why I consider it preferable to avoid the use of tobacco, even in moderation, notwithstanding what has been said and written to the contrary. Against the constant abuse of tobacco, I hesitate not to protest, and distinctly aver, that among medical men, there should in my judgment be but a single opinion, and that, a frank outspoken expression of disapproval.

The continued and excessive use of tobacco, in its various manufactured shapes, since the date of the first introduction of the plant from America into Europe, has not, I fear, failed, as might have been rationally anticipated from its pernicious qualities, to impress deleteriously to a certain extent, each succeeding generation since that event; and to exhibit in many of its votaries of our own day, an accumulated severity of action, gathering continual strength and increasing proportions like the rolling snow-ball, and destined quite possibly, to hereafter culminate in an amount of physical suffering, more extensive and alarming than many of us may now be either prepared or willing to credit.

Such intimations, as to the results of the inveterate abuse of tobacco on our race, present and future, will not, I trust, excite surprise, or be regarded as visionary, extravagant, or unreasonable. They are not new with me, and only strengthened by years of

observation—indeed, every one of us have undoubtedly sufficient opportunities to observe, if we will, the unpleasant consequences of this social evil. Knowing too, as we must, that the habit increases with fearful strides in every quarter of the globe,—the rich and the poor, the old, the middle aged and the young—the most intelligent, highly cultivated and refined—and the most degraded, savage and brutal,—in a word, with comparatively few exceptions, all ranks, professions and classes of society, from the prince to the beggar, whirling in this round of infatuation,—what can, or rather more correctly speaking, ought to be anticipated, but a future replete with the legitimate fruit of such gross indulgence, and very probably, reasoning on correct physiological principles, a degeneracy of race in multitudes of instances hereafter, sad to contemplate, and markedly illustrating the recorded truth, "that the sins of the fathers are visited on the children."

How the appetite for an indulgence, naturally so repugnant and disgusting to taste and smell, was at first ever tolerated, and has finally succeeded in not merely maintaining but constantly increasing its hold on us as a people, acquiring the enormous proportions we on every side behold, appears to me the strangest of anomalies—and surprised at the undeniable fact, I am forcibly reminded of the truth and appropriateness of the old Latin proverb, so literally and remarkably fulfilled in it, "*De gustibus non est disputandum.*" It has been suggested on respectable authority, "that tobacco must possess properties, peculiarly adapted to the propensities of our nature, to have thus surmounted the first repugnance to its odor and taste, and to have become the passion of so many millions." This reasoning may appear at first sight, specious; yet I am confident there can be no real or solid foundation for the assumption. Certainly, the present very general use of the plant does not absolutely prove it. Many bad habits, as the immoderate employment of wine, spirit, opium and Indian hemp, which are very prevalent, and detrimental to health in excess, few or none will be found bold enough to uphold, "as possessing properties, peculiarly adapted to the propensities of our nature," and why not these as well as tobacco?

The disgusting taste and smell of tobacco, combined with the distressing, indeed deadly impressions produced on the nervous system, and, through this, on the rest of the organization by it, when first employed, and, until tolerance has been established, rationally and to my mind, conclusively prove, "that it possesses

no such properties, peculiarly adapted to the propensities of our nature." It is also notorious that many inveterate users of the weed, in every shape, have in their earlier efforts to acquire the luxury of this enjoyment, experienced no trifling obstacles in mastering the difficulties of their lesson.

The truth is, and I think it patent to most sensible and candid persons, who will take the trouble to carefully and broadly investigate the subject; that tobacco, like other unfortunate and unnatural practices, is merely a habit, and a bad one, morally and physically considered. Morally, because its use often leads to debasing customs, and vicious indulgences,—physically, in so much that its inveterate abuse violates perpetually well recognized laws of our nature, and pretty constantly insures, sooner or later, its own merited penalty. It is also very generally a stern and exacting master when in the ascendency, holding its victims usually in an unrelaxing grasp to the end,—few compared with the vast numbers of its devotees, succeeding when even willing, in completely disentangling themselves from the meshes of its close net.

Is it then advisable or wise, for any to voluntarily place themselves in that state of bondage from which they may afterwards, however desirous, find it impossible or exceedingly difficult to escape?

Again, if tobacco really "possesses properties peculiarly adapted to the propensities of our nature," how are we to account for the historical fact that about seventy-six years, I believe, elapsed between the date of the introduction of tobacco smoking into Europe, until the pipe made its appearance in England. Such record would rather show a slow adoption of the practice, and go with other sufficient reasons to prove, that the mere customs and habits of men should never be tortured into meaning nature's intention, however acceptable to any, such interpretation may occasionally be.

These remarks will suffice at present, to convey my general impressions of the results of tobacco immoderately used, in deranging health and frequently transmitting bodily deterioration, points on which I feel satisfied: likewise of its tendency to debase. We can constantly witness, I am correct in saying, this last effect among the lower classes of society, and occasionally even in higher circles. In women excessively addicted to the habit, the consequences are not unfrequently deplorable; causing neglect of

domestic duties, cleanliness, and blunting their finer sensibilities. I moreover imagine that the uncontrollable and insatiable desire for tobacco, which we find in some cases such difficulty in correcting, is frequently like that for spirit and wine, transmitted from father to child; in no other manner can I so satisfactorily and charitably account for this *furor tabaci*,—this perverted, may I not truthfully add, diseased appetite.

Having arranged these observations, principally with the view of directing your attention to the hazards too frequently accompanying the undue and constant abuse of tobacco, it would appear scarcely necessary to remark, that I trust what has been and may be hereafter stated will be regarded, as applying more particularly to such excess. While inimical to its employment, and believing it to be rarely useful or necessary in the strict meaning of these words, I would not absolutely deny that under peculiar circumstances and in especial cases, the contrary might not be true; or that individuals prudently and guardedly employing the weed, may not luxuriate in what they are pleased to regard as an enjoyment, with impunity, as they unquestionably often appear to do. This, however, is not sanctioning the practice.

Furthermore, if asked what I mean by moderate indulgence in the article, choosing to avoid specific reasons, I reply: such limits as will command the assent of most candid, temperate and well balanced minds, free from extreme prejudices. Such is the best disposition I can make of the matter, as it is simply impracticable to lay down in each case precise rules,—what may in one instance constitute moderation, in another is frequently excess. Individually, I cherish no exalted regard or respect for tobacco, and if the generality of mankind esteemed it as little as myself, small indeed in amount would the mischief produced by it be; nevertheless, I am neither so foolish or unreasonable as to suppose that all can be made to think or act alike on this question, or on a great number of others.

Bearing these in mind, the many evils that do frequently succeed the very free employment of tobacco, and surely, these cannot be questioned, I am persuaded, it is wiser, never to resort to it, although some apparent advantages may occasionally seem to accompany its use. Yet, if persons must smoke, I counsel them to indulge moderately,—to affix tubes to their cigars,—to select clean new pipes, avoiding such as are discolored from use and age, which, while adding to their merchantable value, renders them

only the more dangerous. Also to smoke alone, so far as possible, and as a rule, to avoid rooms where the air is loaded with the poisonous products of many pipes or cigars or both, as may be. It is surely sufficient, to inhale the volatile poisons of your own smoke, without also receiving those of your neighbors engaged in the same practice.

The history of tobacco furnishes a remarkable record of the rise, progress, and extensive prevalence of one of the most seductive habits in existence, and we will occupy some minutes in very briefly glancing at a few of its most prominent and characteristic features.

Tobacco is the common name of several species of plants of the natural order *Solanaceæ*, genus *nicotiana*, as likewise of the dried leaves of these in their plain and manufactured shapes. These different species, "are mostly herbaceous annuals, rarely shrubby, with large ovate leaves, covered with clammy hairs, and are natives of warm regions, especially tropical America, although some are found in the East Indies." They all possess that peculiar principle usually called narcotic, [denied however by Dr. Richardson of London, who believes tobacco to be no more a narcotic than strychnine,] and for which many of them are so extensively cultivated. This property exists in all parts of the plant, but the leaves are generally used for manufacturing purposes. The most important species of the whole is the common tobacco of commerce, called Virginian or *Nicotiana Tabacum*, the cultivation of which we are informed had already extended, before the discovery of this continent by Columbus, far to the north of those regions in which the plant is indigenous. The other principal species are the green tobacco, or *Nicotiana Rustica*, called English, because it was the first kind introduced into England for cultivation, in parts of which it thrives admirably, and were it not that the revenue laws there prohibit its culture except for scientific purposes, would undoubtedly be largely and profitably raised. The *Nicotiana Persica*, a native of Persia, furnishing the mild Shiraz tobacco highly esteemed in the East. The *Nicotiana Repanda*, found in Cuba; the *Nicotiana Quadrivalvis*, cultivated by the Indians on the Missouri and adjoining regions; the *Nicotiana Multivalvis*, by those on the Columbia River, and the *Nicotiana Nana*, by the tribes of the Rocky Mountains. An excellent quality of the common tobacco, stated to contain less gummy matter, is also very successfully raised in many portions of our

own State, commanding a high price in the market, prized and employed as wrappers for expensive cigars, being regarded, I am informed, as equal if not superior to the Havana leaf for such purposes.

Tobacco was brought to the observation of Europe through Columbus and his followers, who for the first time beheld the practice of smoking in the Island of Cuba in the year 1492—the natives there, smoking rude cigars formed by wrapping cylindrical rolls of the dried leaves of the plant in the native leaf. The cigar is thus of ancient origin.

The seeds of the plant were introduced into Spain and Portugal, by Gonzalez Hernandez de Oviedo, in the former of which the plant was only cultivated for ornamental purposes, until Nicolo Menardes lauded it extravagantly for medicinal uses. From Portugal Jean Nicot, then French Ambassador at that court, sent either the seeds or the plant itself, about 1559 or 1560, to France, where shortly after it appeared and was employed in the shape of snuff. About the same period tobacco was carried into Italy, and Raphelengi, an Englishman, who had familiarized himself with the pipe in Virginia, introduced it into England, Sir Walter Raleigh following suit after Sir Francis Drake's return to that island in 1586. Seventy-six years thus elapsed, as already observed, from the first discovery of tobacco in America, until the habit became at all fixed in Europe. After this the custom did rapidly extend, although it is very questionable whether such would have been the fact, but for the torrent of abuse and opposition so unsparingly poured out on it. The most violent and injudicious denunciations were unceasingly hurled against its employment, and among them appeared the celebrated and remarkable counterblast of that pedantic monarch, James I. of England, in which, with much more, he declared it to be, "a custom loathsome to the eye, hateful to the nose, harmful to the brain, dangerous to the lungs, and in the black stinking fume thereof nearest resembling the horrible stygian smoke of the pit that is bottomless," and it is a little surprising how accurate some of these statements have subsequently proved. Popes Urban and Innocent the Second, threatened its admirers with the thunders of the Church. Some of the Turkish Sultans declared smoking a crime, and Amurath the Fourth decreed its punishment to be a cruel death. The pipes of smokers were thrust through their noses in Turkey. The noses of smokers were said to have been cut off in Russia, and in the earlier part of the

seventeenth century, Abbas the First, Shah of Persia, denounced both opium and tobacco, and when conducting a campaign against Tartary, is stated to have issued a proclamation commanding that every soldier on whose person tobacco was found, should have his nose and lips cut off and be burnt alive. The motives actuating Amurath, are claimed to have been dread of the antiphrodisiac property of tobacco on the population of his empire. Numerous other shocking atrocities, which it is not necessary to recite, we are informed, were perpetrated under authority, in the vain expectation of rooting out the use of tobacco. Enough has been presented to show how determined the efforts were to banish it. In the face of interdictions and mortalities, the habit increased with still more rapid strides, and it has continued to grow, until in our day the extension of it is so far greater than ever, that without exaggeration it may be regarded as almost universal. It is remarkable that while the custom of smoking did not prevail in the East until the seventeenth century, the Turks and Persians are now the greatest smokers in the world. In India all classes and both sexes smoke, while in China, where the practice was more ancient, we are told that even girls of eight or nine years of age, wear as an appendage to their dresses, small silken pockets, to contain the pipe and tobacco. Throughout Europe and great Britain the practice is very general, and if possible every day increasing; and in these United States, the consumption of the weed in smoking, chewing and snuffing, is perfectly enormous.

One of our Commissioners of Revenue, if I am not mistaken, has informed us that cigars and tobacco cost the country annually $101,948,311.84, and doubtless the amount grows daily larger.

I perceive by the London Lancet of May, 1868, extracted from the Times newspaper, that the quantity of tobacco cleared for consumption in the United Kingdom in the year 1841, amounted to thirteen ounces and three-quarters per head of the population. In the year 1861 it had increased to one pound three ounces and a half, and in 1865 to one pound five ounces, so greatly is the habit of employing tobacco extending there. It likewise appears that while smoking on every side increases decidedly, snuffing on the contrary fortunately diminishes. The present amount of tobacco annually produced over the whole world, has been estimated at four hundred and thirty-two thousand four hundred tons; and I have likewise within a short period seen a statement that the cost of the manufacture of pipes in France alone, during the

year 1867, amounted to fifty-six millions of francs. From all thus far presented, it is evident that if tobacco is good for nothing else, it creates profitable business, and furnishes largely increasing revenue incomes to the different governments. There is authority to show, "that the inhalation of the fumes of certain vegetable substances for inducing inebriation, and for medicinal purposes, was very early practiced;" and while there are reasons likewise for supposing that the tobacco plant may have existed from time immemorial in parts of Asia, there are none to determinedly prove that it was ever there used in the exact way we employ it, unless in China, where it probably was for smoking; and if so, the custom did not then extend to neighboring nations, and was unknown to the rest of the old world until it was introduced into it from the new one.

The exact origin of the word tobacco is doubtful—some deriving it from the Indian *tobaco*, the tube or pipe through which the Indians or Caribbees smoked the plant; others from Tabaco, a province of Uticas; and others again from Tobago, one of the Caribbean group. Of the source of the generic term *Nicotiana*, there is no question, being so named after Jean Nicot, already spoken of.

Within a few months I have seen with pleasure the statement that a league had been formed in France, each member of which engages not only to abstain from smoking, but to employ all his influence to discourage the habit among his friends and acquaintances, which, if reliable, I regard as a hopeful sign and a step in the right path, likely, if properly directed, to hereafter end in beneficial results.

To accurately estimate the nature and full extent of tobacco poisoning, we must first possess some definite knowledge of the agents entering into its composition, and their action on our bodies in producing the mischief following its use, on which we can naturally and rationally only expect light in the analysis of the plant and its smoke. After a careful investigation, I can find no more complete and perhaps reliable analysis of the fresh leaves of the plant than that made by Posselt and Reimann, as follows: "*Nicotia, Nicotianin*, Bitter Extractive, Gum with Malate of Lime, Chlorophyl, Albumen and Gluten, Malic Acid, Ligain and a trace of Starch, Sulphate, Nitrate and Malate of Potash, Chloride of Potassium, Phosphate of Lime, Malate of Ammonia, Silica, Water, and also according to Goupet, a little Citric Acid." We

have here positive evidence of the compound and active character of the plant, the ingredients of which doubtless vary essentially, according to climate, soil, culture, and possibly other unknown causes.

The most essential and peculiar active principles of tobacco is the *Nicotin* or *Nicotine*, a colorless, or nearly colorless liquid alkaloid of very acrid burning taste even when largely diluted, highly volatilizable in its perfect purity, and then most intensely irritant to the nostrils, with an odor recalling that of tobacco,—inflammable, soluble in water, Alcohol, Æther and Turpentine,—strongly alkaline in reaction and capable of forming chrystallizable salts with the acids. It is one of the most active of known poisons, nearly equaling in deadly violence the strongest preparation of Hydrocyanic Acid. A single drop of the concentrated alkaloid, has destroyed a dog, and small birds have been killed by coming in contact with its vapor. The *Nicotin* obtained by Vauquelin, Posselt and Reimann, was as just observed, a nearly colorless volatile liquid, and afterwards ascertained by Henry and Boutron to be an aqueous solution of the alkaloid in combination with ammonia. These chemists, finally succeeded in extracting Nicotine in a complete state of purity. It is proper to here say that in tobacco, Nicotine exists combined with an acid, and is then when exposed to heat, less volatilizable. Were it otherwise, few or none could smoke tobacco with impunity.

Nicotine exists in Virginian and Kentucky tobacco, in the proportion of a little more than six parts to one hundred parts of the dried leaf; in Maryland tobacco, in over two parts, and in Havana in two parts—the other varieties range between these quantities.

Nicotianin, or concrete volatile oil of tobacco, or "tobacco camphor," often so called, is a fatty substance, of aromatic bitterish taste, possesses the marked smell of tobacco smoke, and is the odorous principle of the plant. It leaves an impression similar to tobacco smoke on the tongue and throat, and when swallowed in the quantity of a grain, has induced giddiness, nausea, and inclination to vomit: and applied to the nostrils, it likewise occasions sneezing. According to Lasdarer, the fresh leaves of tobacco "yield no Nicotianin;" and if the assertion is correct, it must of course be generated or developed in the drying process, assisted by air and water.

The most interesting, and to me satisfactory analysis of tobacco smoke, as displaying its action on our organism, is that made by

Dr. Richardson, of London; who in obtaining it, imitated the ordinary methods of smoking as follows. He constructed a pair of small bellows on a principle which made them to resemble the action of the lips and chest of the smoker. The bellows drew over the air in small whiffs; part of the smoke produced by the combustion, was allowed to escape from the mouth of the pipe or lighted end of the cigar, as occurs in ordinary smoking, while the remaining portion of it, which in the smoker would be drawn into the mouth and lungs, was received into the bellows, afterwards collected, and carefully subjected to analysis—and to make the examination complete, different pipes and different cigars were employed. In conducting these experiments the widest differences were found, arising from the various kinds of tobacco employed, as also from different pipes and cigars—and I propose to lay before you the substances found common in all the varieties of tobacco smoke, in Dr. Richardson's words, much abridged, for they are valuable in illustrating what we are discussing.

1st. "There is in all tobacco smoke a certain amount of watery vapour."

2d. "A small portion of free carbon is present, and it is to the presence of this that the blue colour of tobacco smoke is due. It is also this carbon which in inveterate smokers settles on the back part of the throat, and on the lining membrane of the bronchial tubes, creating a copious secretion which it discolours, and which is coughed up, of a dark coaly appearance."

3d. "There is in the smoke a portion of ammonia, giving to it an alkaline reaction—it is this that bites the tongue after long smoking, and that makes the tongue and throat of the smoker so dry, and induces him to drink as he smokes: and that partly also excites the salivary glands to so abundantly secrete. This ammonia, also, exerts a decided influence on the blood."

4th. "Carbonic acid is always present in the smoke of tobacco. The amount of carbonic acid produced by the combustion of various specimens of tobacco, differs greatly, so that it is difficult to estimate properly the general effect of the acid—but the inference is fair that the sleepiness which follows prolonged inhalation of tobacco fumes, as well as the headache and lassitude, are largely due to this agent, which in so small a proportion as five per cent. in the air inspired, produces the symptoms specified."

5th. "There is yielded from tobacco smoke a product having an oily appearance. The colour of this differs in shade, according to

the tobacco from which it is derived; but in a general way it has the colour of common olive oil. It constituted the substance called by Vauquelin *Nicotine*. This oily matter on examination is, however, found to be a compound body, and the term nicotine is not now applied to it, in the manner suggested by the above named chemist. This oil (so called) derived from tobacco smoke by condensation, yields on further analysis, evidence of the presence of three bodies, viz: a fluid alkaloid body, true nicotine; a volatile substance having an empyreumatic odour, Nicotianin; and an extract of a dark resinous character, and bitter taste. These three agents possess very different properties, and produce very different effects. When tremor, palpitation, and paralysis succeed smoking, they probably depend on the nicotine. The marked odour that exhales from the breath and skin of the confirmed smoker, arises from the Nicotianin: while the peculiar and disgusting taste which an unpractised smoker experiences, when he places a foul pipe between his lips, is due to the bitter extract. It is also believed that this last is the cause of the vomiting in those unaccustomed to the use of tobacco."

While fully recognizing and appreciating the importance and truth of Dr. Richardson's concise observations as above, in general, I think some of the other noxious agents of tobacco may have their share of responsibility with the bitter extract, in producing this last symptom, the vomiting. In his remarks I think we have in small compass, the key to most of the unpleasant effects of tobacco on the organism.

Nicotine, from the smallness of its amount, and its little volatility in the plant, increased however by the combustion and heat attending smoking; although one of the most potent poisons, does not ordinarily at first, exert those dangerously unpleasant effects on the smoker or chewer, especially the former, we might anticipate from its nature—but when after prolonged use, particularly where there is defective elimination, it finally reaches the blood in sufficiency; it fails not to induce symptoms of the most serious and sometimes alarming character, and even occasionally fatal results.

Let us now carefully note these symptoms, and I think you will join me in saying, that they are numerous enough, and urgent enough, to often warrant what the opponents of tobacco charge against it. Before proceeding, we will for a moment inquire, through what channels the poisons of tobacco in smoking, first find admission within us, and how they are afterwards eliminated.

The volatile substances, nicotiania and ammonia, we inhale during the process of smoking, and afterwards get rid of through exhalation of the breath and through the skin, as already remarked. While the bitter extract and nicotine, dissolved in a little aqueous fluid, enter the mouth in the one case, by that part of the cigar between the lips, and in the other, from the bowl of the pipe traveling along its stem, and thus finally arriving at the same destination. These last mixed with the saliva are then swallowed, absorbed, commingled with the circulation, and finally in every probability removed through the agency of the kidneys. I have over and over again been rendered fully sensible, indeed unpleasantly so, of the free elimination of nicotiania by the skin and breath, in many very confirmed smokers, even when not actually plying their favorite recreation; and any skeptic here may abundantly satisfy himself of this fact, by sitting for a reasonable time in a closed room, with one or more of these persons. The air of an apartment under such circumstances, is frequently disgustingly intolerable to me, although I may possibly be altogether too sensitive. It seems proper also here to add that much drinking, during smoking, has the bad effect of more extensively diluting and fixing the poisons, and thus rendering their elimination the more difficult.

Tobacco employed by those habituated to its use, is claimed to soothe, to calm restlessness, to retard waste, and to produce a languor, repose, and delightful dreaminess, highly enjoyed and prized by its admirers. On the contrary, in persons unaccustomed to its employment, it induces in small doses, a degree of warmth in the throat, sometimes also in the stomach, with frequently a sensation of uneasiness in this organ—a little nausea, and a slight disposition to giddiness. In larger quantities, it causes nausea and vomiting, vertigo, disturbed vision, pain at the pit of the stomach, sweating, with coldness of skin, exhaustion, frequent small fluttering and irregular pulse, and most distressing general uneasiness. In further increased amounts, all these symptoms are intensified; there is greatly augmented embarrassment of the nervous and circulatory systems—frequently including convulsive action, and finally muscular relaxation, deathly faintness, paralysis, stupor and death—most of which alarming results I have in former years witnessed, with the exception of the last, from the exhibition of the tobacco enema in disease; now thanks to anæsthetics, happily and properly banished from the list of remedial agents.

Whenever death happens from tobacco poisoning, it is probably due to the direct action of nicotine on the *Medulla oblongata*, acting through the Pneumogastric nerve on the heart, and paralyzing its action. M. Tardieu recently asserts, that animals poisoned by nicotine, always fall down on the right side. Tobacco, from its violent and frequently uncontrollable action on the animal economy, has never been extensively prescribed as a medicine by the profession; and we do not err in remarking, that as a rule, it should now rarely or never be. Possibly it may occasionally prove serviceable in certain conditions of asthma; but we certainly have even here better and safer remedies. A few may yet occasionally employ it externally, when it ought to be most cautiously directed, and not resorted to where there is cuticular abrasion, or ulceration of skin; fatal consequences have followed such misuse, especially when the empyreumatic oil of tobacco, commingled with the ashes of the same, constituted the application.

The most permanent impressions of chronic tobacco poisoning long continued, on the body, are as we might naturally anticipate, principally manifested on the lips, in the mouth, on the tongue, on the tonsils and throat, in the nostrils in snuffers, and in the frontal sinuses. On the mucous and muscular coats of the stomach, and to a certain extent, on the intestines,—on the heart, rendering it irritable, irregular in action, painful, and positively weakening it: and also frequently affecting unpleasantly the mucous membrane of the bronchial tubes. On the blood, which it thins, and according to Dr. Richardson, produces certain marked changes in the forms and disposition to cohesion of the red globules; or rather in that mutual attraction for each other, so characteristic of their perfectly healthy state—quickly, however, rectified, after due elimination of the poison, according to the same authority. On the cerebral, spinal and sympathetic systems, all of which it more or less notoriously disturbs; engendering a host of unpleasant functional difficulties, persistent in action, distressing to bear, difficult if not impossible to alleviate or remove, without complete abandonment of the exciting cause,—and when long persevered in, paralysis, and I very much apprehend occasionally, changes even of structure. The color of the skin, especially that of the face, and the expression of the latter, are often in confirmed ill-health, arising from long-continued chronic tobacco poisoning, very marked and peculiar. In such extreme cases, I have frequently noticed the skin to resemble the cancerous hue.

On the organs of vision, dimness and even complete loss of sight. Several weeks since, I was consulted by a party, a heavy smoker and chewer, suffering under distinct amaurotic difficulty, from the dreadful abuse of tobacco. Unable to persuade him to altogether abandon his baneful habit, I succeeded in making him most materially curtail it, and with the result of improved and still improving sight. In inveterate smokers, Dr. Richardson states that the pupils are unnaturally dilated, which dilatation increases during smoking; a result solely due to the nicotine, as he has observed it to follow the action of nicotine simply,—also, that the symptom which of all others marks through vision, that tobacco is acting injuriously, is the long retention of images on the sensorium, after the eye itself is withdrawn from them. On the *Portio Mollis* of the seventh pair of nerves, tobacco in excess sometimes produces degrees of deafness, with abnormal sounds. On the gustatory nerves, the effect often is to blunt their delicacy, and interfere with exact taste—and on the *schneiderian* membrane, it tends to congestion, thickening and impairment of smell, when snuff is too freely employed. A few extended remarks on some of the above statements and others in connection with them, may not be misplaced, and will possibly display this part of our subject in a clearer light,—and with your consent, we will shortly consider them. The mucous surfaces of the lips, mouth, gums, throat, soft arch and uvula, we find under the condition just noticed, often red, tender, swollen, dry, disposed to exfoliate in spots, the tonsils enlarged, gorged and painful, and the pharynx partaking of the same disposition. We have in fact, the trouble described and known, as the tobacco or smoker's mouth: easily recognized, annoying, and in its acute stage, one of positive suffering; difficult of cure, and only effectually relieved by dropping tobacco. I have seen added patchy ulceration of these tissues, sponginess of gums, and recession of them, exposing the necks of the teeth. I do not know that tobacco destroys these last, many think it preserves them, but it certainly renders them unsightly through discoloration. The lower lip is likewise often the seat of cancerous ulceration, more rarely the upper; believed, and I think justly, to be caused in very many instances by the persistent use of the foul pipe, saturated with the noxious agents of tobacco, and probably assisted by the increased temperature of it, necessarily accompanying the act of smoking. Fissures and cracks of the lips and their commissures from the same, but more frequently I am inclined to think, from

the use of the cigar, are by no means uncommon; as also ulceration of the cheeks and tongue, with occasionally small circumscribed enlargements of this last beneath its mucous membrane, rebellious to ordinary treatment, unless tobacco be completely withdrawn. There are also not wanting well recorded positive malignant conditions of all these, from the same cause; so accurately described, and so painfully terminating, as to leave no question in my mind of their true nature. The salivary glands of the mouth, too, accustomed to the perpetual stimulus of the tobacco, at length frequently cease to secrete when it is withdrawn; the mouth becomes insupportably dry and uncomfortable, and the sufferer either resorts to drink usually stronger than water, or is compelled to chew stimulating substances, as dried or fresh orange peel, cardamoms, or flag root, to relieve his disagreeable sensations.

The effects produced on the stomach by the long continued and immoderate employment of tobacco in all its forms, more especially perhaps in confirmed smokers, are marked and well established, in habitual disturbances of this organ, exhibiting functional derangements, varying in character and degrees of intensity, and not unfrequently, as already intimated, I cannot avoid suspecting, even in structural alterations. It is useless, in my humble judgment, for some to affirm with the positiveness they do, that these last are unknown from the abuse of tobacco; and that functional difficulties alone are to be expected. Experience has taught me differently; in corroboration of which I say, that many years since I witnessed a marked case of *scirrhus* of the *pylorus*, in an elderly gentleman then residing in this city, and well known in it, entirely caused by swallowing the juice of tobacco commingled with his saliva, while chewing, for several years.

"Professor Petit Radel is likewise said to have died of cancer of the *pylorus*, from excessive smoking."

The late cautious and eminent Dr. Prout, in his work on the nature and treatment of stomach and urinary diseases, observes, "the severe and peculiar dyspeptic symptoms sometimes produced by inveterate snuff-taking, are well known; and I have more than once seen such cases terminate fatally with malignant disease of the stomach and liver. Great smokers also, especially those who employ short pipes and cigars, are said to be liable to cancerous affections of the lips. But it happens with tobacco as with deleterious articles of diet, the strong and the healthy suffer com-

paratively little, while the weak and predisposed to disease, fall victims to its poisonous use."

Perforation of bowel in typhoid fever, as a sequence of the immoderate use of tobacco, has also been charged by Mr. Fenn, in the London Lancet, for January, 1857, when describing some of the results of his investigations on its effects.

There certainly appears to be no reasonable doubt that where the poisonous agents in tobacco are constantly swallowed and absorbed in free amounts daily, more particularly if due elimination is not thoroughly active, that in old and inveterate smokers, chewers and snuffers, the mucous coat of the stomach is often extensively or partially irritated and congested, and in severe instances chronically inflamed, thickened, and possibly ulcerated in patches. As a consequence, it must follow in such cases, that the gastric juice itself from this disordered condition of its secreting membrane, cannot but be more or less impaired in quality and perhaps quantity, interfering unpleasantly, indeed essentially, with ordinary digestion.

Nicotine unquestionably exerts a powerful influence on the muscular coat of the stomach, as also on the intestinal tube,—in small doses, exciting in the latter slight movement of the muscular fibres, and hence the explanation why moderate smoking acts as an aperient;—but in excess, the same agent (nicotine) induces a palsied condition of these fibres, ending in debility and impairment of the digestive organs, and constipation.

In some persons, the excreting process we practically know is less active and reliable, from various causes, than in others; and these last must suffer proportionably from the influence of the noxious ingredients in tobacco: whose immediate operations on the body are two-fold,—occasionally acting, particularly in excessive quantities suddenly received, directly on the nervous system, as well as through the circulation; but in the slow chronic poisonings, as constantly witnessed, the obnoxious ingredients are doubtless first absorbed, then pass into the circulation, through which they subsequently produce their unfavorable impressions on the nervous system at large. Yet if willing, for the sake of argument to admit, that no organic changes follow the abuse of tobacco; is it not undeniably correct that the constant chronic blood poisoning dependent on it, notwithstanding the untiring efforts of the organization to disembarrass itself by persistent elimination, may be expected finally, in many instances at least, to so affect the en-

tire nervous matter, and consequently the muscular apparatus, the digestive organs, the heart, and the glandular system, as without the existence of positive organic disease, to slowly yet surely sap the foundations of health and life, and terminate in premature death? I think so, and believe we are justified in regarding the confirmed and excessive smoker, chewer, and snuffer, as ordinarily living in a continual state of functional disorder, and at times probably in an infinitely worse condition.

In addition to what has already been remarked of the operation of tobacco on the heart, it is surely true that the unrestrained use of the article interferes even more seriously with the contractile power of that organ; producing often in severe paroxysmal suffering, an assemblage of most painful and alarming symptoms, in direct connection with its employment: frequently involving the muscular *parietes* of the chest and arms, especially the left, causing an amount of agony during the attack almost insupportable, and occasionally a sensation of impending dissolution. Whether such protracted and oft repeated disturbances, conjoined with the continuance of the evil, may not in some instances terminate in actual structural changes of the central organ of the circulation, is a very important and pertinent query, that I am unfortunately unable to definitely answer; yet I cannot avoid the suspicion, that occasionally such alterations do happen, and if so, should rather look for them in a softened condition of the muscular fibres of the heart, and in more advanced years, possibly in actual fatty degeneration of it. These however are surmises, and whatever weight they may possess with me, only as such, do I present them to your consideration.

My impressions, likewise, are that the *senile arcus* is earlier and more frequently developed in those who employ tobacco and smoke excessively; and if this be a fact, by parity of reasoning, is it irrational to suppose that fatty degeneration of the coats of the arteries, more particularly of the minute cerebral arteries, might be produced by the same cause?

Apoplectic and paralytic affections of various intensities, dependent on sanguineous effusions into the cerebral substance, and between its membranes, have undeniably very much increased in frequency, during past years. I employ the term apoplexy, bearing in mind that this name is from long usage indiscriminately and improperly applied to many diseases, dependent on very different pathological conditions, and constituting different affections. While then perfectly aware that

the increase of these forms of disease is properly attributable to other acknowledged causes, I again pointedly repeat the inquiry, why may not so injurious a habit as the abuse of tobacco, be occasionally also one of those very causes which induces similar changes in the coats of the vessels? Reflection only strengthens this probability with me. Epilepsy and chorea, have been attributed to the abuse of tobacco. Personally, I am unaware of any good reason for so thinking. On the contrary, I consider there are grounds for supposing that insanity is sometimes induced by the excessive abuse of it: and published statistics seem to favor the view in many instances. I am also disposed to believe that insanity in inveterate smokers, chewers, and snuffers, (especially the first), is more difficult of cure, and of longer duration than cases dependent on many other causes. I have far less hesitancy in asserting, that in addition to the general distressing functional disturbances produced on the entire nervous system by tobacco, already spoken of, the brain and spinal cord do occasionally suffer from positive organic lesions, the result of it; especially in those instances where the pipe, the cigar, and the quid, may literally be said never to be out of the mouth, except at meals and during sleep,—and it is precisely under such circumstances that softening of the brain, and softening of the spinal cord, have been developed, noticed, and recorded.

I have seen it asserted, too, that the late lamented Trousseau regarded this disease as one of the sequences of persistent and immoderate smoking; and let me here remind you, that probably there are often subtle structural changes in the nervous matter, especially in the brain, under disease, invisible to the naked eye after death, however carefully made the examination may be, and not discoverable by any present known means; neither microscopist nor morbid anatomist having yet detected such alterations.

See in the London Lancet, of February 21st, 1857, Dr. Pugh's interesting statement on the effects of tobacco on the Australian squatter, among which with other remarks he writes, "Unfortunately the occasional pipe of tobacco is soon merged into a life, where no moment is tolerable in which the narcotic vapor is withheld. His morning smoke is commenced while in his bed, his day is passed in a cloud, and the pipe accompanies him when retiring to rest, to be laid aside when overpowering sleep prevents its further use. The first effects of such a life are a disregard for cleanliness and personal appearance. The features become bloat-

ed, and the lips lose their healthy hue. The cheerful and active movement has given place to a heavy listlessness. The character of the man has undergone a change. When roused he attends to business, but rapidly returns to a state of abstraction. Dyspeptic symptoms annoy him, and soon the heart becomes irritable, and the pulse is irregular. Hypochondriasis in its worse forms is presented, accompanied at times with a suicidal tendency; and I have known individuals in this condition rush to the town, dreading the consequences of a longer continuance in their life of solitude. The brain and ganglionic system become involved, and I have seen softening accompanied by paralysis. Amaurosis is not an unfrequent indicator of the existing nervous prostration. When under treatment, whether from disease or accident, the inveterate tobacco-smoker quickly presents evidence of the constitutional operations of the narcotic. Typhoid symptoms show themselves at a very early stage, and smoking delirium is present, which requires to be combated by active tonic remedies."

The above statements present a sorry aspect for tobacco, and after liberal allowance for the direct effects of isolation and self-expatriation on the squatter, tell severely on it. Mr. Solly, of London, one whose ability and professional standing entitle his opinions to every consideration and respect, in a clinical lecture on Paralysis, delivered at St. Thomas' Hospital, and reported in the London Lancet, for December 31st, 1856, among other observations remarks, "There was another habit, also, in which my patient indulged, and which I cannot but regard as the curse of the present age,—I mean smoking. I know of no single vice which does so much harm as smoking. It is a snare and a delusion. It soothes the excited nervous system at the time, to render it more irritable and feeble ultimately. I believe that cases of general paralysis are more frequent in England than they used to be, and I suspect that smoking tobacco is one of the causes of that increase."

The following extracts are likewise taken from a subsequent communication on the tobacco question, by the same gentleman, in the Lancet, of February 14th, 1857.

"The more I think of the tobacco question, the more it haunts me. I feel that I cannot do justice to its importance, but I am anxious to add something to my last communication. Every day the subject is forced upon my mind. I scarcely meet a friend or patient who does not bear his testimony to the mischief of which

he has been the witness, in his own case or that of some friend, from tobacco."

"It seems almost trifling with the subject, and yet the extreme ignorance which prevails regarding this frightful pest, rendering even trifles weighty in the scale, induces me to remind all smokers, and those of our brethren who madly encourage it, that the first effect of a cigar on any one, demonstrates that tobacco can poison by its smoke, and through the lungs, just as certainly as through the bowels."

The latter part of this quotation will be more clearly understood if I remark, that in his communication Mr. Solly previously alluding to the injudicious employment of the tobacco enema, had observed, that "he had understood a celebrated surgeon and rather an obstinate one, since dead, had lost five cases in succession, from the effects of tobacco injected into the bowel."

I have introduced these quotations, and properly, to strengthen the suggestions and opinions laid before you in this paper; and could add others equally significant and decided, against the improper use of tobacco, were it necessary. If any person desire to read a formidable array of adverse opinions on this question, collected together and carefully arranged, let him consult the late Mr. John Lizars' work against tobacco. This gentleman was well known and recognized in Edinburgh, during his day, as an eminent Surgeon and accomplished Lecturer on Anatomy and Physiology, and I am pleased to say that in my younger days I had the pleasure of knowing him well, and enjoyed the privilege of listening to his instructive teachings.

Neuralgic attacks in various parts of the body, not hitherto specially noticed this evening, painful and obstinate in character, and clearly due to the poisonous agency of tobacco, are constantly met with in practice; and I make the assertion unqualifiedly, from the plainest evidence, viz: that in such cases within my personal experience, abstinence from tobacco has prevented their recurrence, a return to it reproduced them. Proof conclusive enough. I fear there is likewise cause for apprehension that gross continued indulgence in tobacco, more particularly smoking, does as has been positively asserted, impair the virile power. I incline to the opinion that in some few instances, I have noticed it to produce partial impotency, and occasionally likewise (at least I have so surmised,) an abnormal secretion of the seminal fluid, rendering it for the time being inoperative. Is there risk of inoculation through tobacco

smoke, proceeding from the mouths of persons laboring under syphilitic sore throat and mouth, when inhaled by healthy parties, who may chance to have abraded or ulcerated lips or nostrils? I cannot unhesitatingly answer,—it has been so claimed, and the assertion certainly appears plausible and possible.

Amid conflicting doubts and opinions, there is happily no difference of sentiment among rational and capable men, as to the exceedingly prejudicial results of tobacco on the young; particularly at that stage of life when boyhood is ripening into manhood, and the vital forces are mysteriously striving and struggling to near and finally reach their mature condition. No barrier should then be erected across their path, and no obstacle, however trifling, be deliberately permitted to obstruct and defeat their efforts. The consequences of arrest of development at this period, must often be the infliction of a penalty, perhaps life-enduring; calculated to degrade the future man physically and mentally, and what is still worse, transmit such degradation to future generations. I do most earnestly desire to see this custom of smoking among our very young people diminish and cease; there is nothing more unpleasant to me than to behold, as I every day do, mere boys with lighted cigars stuck in their mouths: and I respectfully entreat them to abandon the habit altogether, or postpone the practice to more mature age, if they value their health, comfort, and future usefulness.

We have occasionally heard much of the assumed advantages of tobacco. What these are we will briefly inquire. That it checks the oxydation of the body, and correspondingly diminishes waste, and in so doing necessarily lessens the organic power, is believed to be known. When therefore mental labor is commenced, and the system is properly nourished, supply being in excess of waste, smoking will often produce a heaviness difficult to overcome, and simply because tobacco arrests assimilation and destruction, suspending for a time to a greater or lesser extent, "that movement of the tissues constituting vital activity." But if mental exertion be prolonged until fatigue and exhaustion are felt, waste being greater than supply; it is said to soothe, give impetus and quickness to thought, to check rapid waste, and to enable the mind to longer, better, and more perfectly perform its task,—also to relieve the sensation of exhaustion, and postpone that of hunger. Two important and proper questions evidently suggest themselves here. Is all this, however true, a rational or natural

process to be constantly repeated during the better portion of a life? Can the organism submit to it in every case, with impunity? I hesitate not to express the opinion, that it probably cannot. Such perpetual stimulation of brain (if the expression is applicable) under mental exertion, has produced and doubtless continues to produce numerous, brilliant and interesting efforts; but could some of the closing scenes of the habit be always distinctly ascertained, we might possibly discover, that many of these splendid results had been altogether purchased at too extravagant and ruinous a rate. There is one point more, on which I ought to say a word before closing this paper, viz., what is the actual condition of many of the internal organs of the body, while persons are learning to smoke? The only notice I can find of such impressions from tobacco, are contained in Dr. Richardson's small, able, and interesting paper, entitled, "For and against tobacco"—published in London, in 1868. He says, "as regards the human body, neither I or any other physician could speak with certainty, for the facts have not been observed; but from analogy derived from the inferior animals, which analogy ought to be very perfect, the conditions of the vital organs are as follows: The brain is pale and empty of blood; the stomach is reddened in round spots, so raised and pile-like, that they resemble patches of dark Utrecht velvet—the blood is preternaturally fluid; the lungs are pale as the lungs of a calf as we see them suspended in the shambles; while the heart, over burthened with blood, and having little power left it for its forcing action as a pump, is scarcely contracting but trembling as if like a conscious thing it knew its own weakness. It is not a beating but a fluttering heart; its mechanism is perfect, but each fibre of its minutest part is impregnated with a substance which holds it in bondage, and will not let it go."

This is a graphic and forcible picture, worthy of careful thought and recollection, and of sufficient importance to seriously influence our views so far as the use of tobacco is concerned, in the daily exercise of our professional labors.

Dr. Richardson believes, that tobacco does produce troublesome functional disturbances—is by no means disposed, if I rightly understand him, to recommend any to adopt the habit of using tobacco—yet denies, that its effects ever result in structural changes; in the latter portion of which opinion, I respectfully yet decidedly disagree with him. None can convince me, that an agent capable of exerting such severe impressions on the organism

at first, as we have just read, and also most unpleasant and harassing succeeding functional disturbances from slow chronic poisoning as is well known, in spite of tolerance, may not occasionally produce positive structural changes. Indeed, I am sufficiently convinced that I have seen it so do.

Many may be disposed to regard this whole subject, as threadbare and worn out; if so, I venture to differ from them, rather viewing it as more probably in the incipiency of its true investigation. Much, too much I acknowledge, has been written on tobacco, in a proper and improper spirit; but good temper, candid investigation, freedom from prejudice, with the steady advance of scientific investigation, can hardly fail to throw additional light on future discussions here, and prove conclusively how much good, and how much evil, accompany and succeed its employment, and little room be left for speculation.

In the meantime we may rest perfectly assured, that tobacco in every shape, especially where the strongest grades are used, and filthy saturated pipes, is apt sooner or later to accomplish its legitimate purpose, whatever that may really be; while peculiar conditions of body will often materially assist it in such work. As practicing physicians, let us not forget or disregard this fact; it is clearly our duty to discourage every habit not conducive to health, and beyond a doubt, all customs we believe to be positively detrimental to it.

The necessity of curtailing these remarks, within the usual limits of addresses before our Society on occasions like the present, has compelled me to superficially glance at many points connected with our subject, and to altogether omit others, with, I am conscious, injustice to it.

The paper however as it is, with all imperfections and shortcomings, is now respectfully submitted to your notice.

ARTICLE XI.

RESEARCHES

ON THE INFLUENCE OF MENTAL ACTIVITY

UPON THE EXCRETION OF PHOSPHORIC ACID BY THE KIDNEYS.*

BY LUTHER HODGES WOOD, PH.B., M. D., OF NEW HAVEN.

In July, 1867, Dr. T. R. Noyes presented to the Examining Committee and Faculty of this College an Inaugural Thesis upon the Excretion of Urea.† In that paper he described certain experiments instituted to ascertain the effect of sleep on this excretion. Among other results he found that the urine of the day was uniformly alkaline, and that of the night as uniformly acid; and this, even when the diet consisted of two precisely similar meals taken twelve hours apart. To account for this fact he suggested "that the causes of acidity were operating in both periods, and that the great increase of alkaline phosphates in the daytime overbalanced the acid reaction thus produced." It was to confirm or refute this hypothesis of Dr. Noyes, that the following investigation of the subject was undertaken.

The experiments here enumerated were all made upon myself, aged 21, weighing 56 kilograms, and in a good state of health.

It is evident at the outset that the difficulties to be overcome in order to change perfectly the mental condition from activity to inactivity, are necessarily very great; and hence, that the results of such experiments are liable to many sources of error. In fact, it is difficult to obtain a state of complete mental inactivity; since

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the mind must always be more or less active during waking hours. By removing as much as possible all the causes for mental exertion, however, on the one hand, and by actively engaging in study, on the other, the mental condition in these experiments has been very greatly varied. But on taking into consideration the many difficulties in the way of a satisfactory result, we thought it best to make three separate series of experiments, each somewhat different from the others in detail, while we endeavored in all to obtain the extremes of brain work.

The phosphoric acid (P_2O_5) was estimated by a standard solution of uranic acetate as proposed by Neubauer.* This process is based upon the fact that uranic phosphate is insoluble in a solution containing sodic acetate and acidified by acetic acid. The minutest amount of the solution of uranic acetate in excess, therefore, gives, when a drop of a solution of potassic ferrocyanide is added to a drop of the solution, a reddish brown precipitate of uranic ferrocyanide. This process admits of very great delicacy—a single drop of uranic acetate added in excess to 50 cubic centimeters of urine being sufficient to give the color distinctly.

After determining the total phosphoric acid, the earthy phosphates in a second portion of the urine were precipitated by ammonia. The precipitate was washed as usual, and the washings added to the filtrate, which of course contained the alkaline phosphates. The phosphoric acid in the latter was then estimated in the manner described for the total phosphoric acid. The difference between the amount of total phosphoric acid and that estimated as alkaline phosphate gives the amount existing as earthy phosphate.

The solids were computed from the specific gravity according to the formula of Christison. The excess of density above 1000 multiplied by 2.33 gives the amount of solids in 1000 parts of the urine. Then, by a simple proportion we obtain the amount of solids in any given amount of this fluid.

The quantity of urine is given in the Tables in cubic centimeters; the amount of phosphoric acid excreted per hour is expressed in milligrams. The amount of phosphorus is given as phosphoric acid (P_2O_5) whether it be excreted in combination with alkalies, alkaline earths or both together. In the experiments of the first four Tables, the twenty-four hours were divided into four periods: two of six hours each for the day, and two periods of four and eight

* Analyse des Harns, by Neubauer & Vogel. 4th Edition, Wiesbaden, 1863, p. 188.

hours respectively for the night. In the 5th and 6th Tables the twenty-four hours were divided into four equal periods, each being six hours. The last two experiments were made upon the urine of the day and of the night as a whole, making but two periods of twelve hours each.

During the first period of seven days the diet was an ordinary mixed one, and the amount of study moderate. The results are given in Table (1). During the second period the amount of study was the same as in the first, but the diet was a stated one. Two meals a day were taken, at 7½ A. M. and 7½ P. M.; each meal consisted of—

Bread	1½ oz.	=	42.45 grams.
Beef	1½ "	=	42.45 "
2 Eggs	3½ "	=	99.05 "
Butter	¼ "	=	7.08 "
Potato	1½ "	=	42.45 "
Water	12 "	=	339.60 "
	20½ oz.	=	573.08 grams.

The results of this period are given in Table (2).

The change from an ordinary mixed diet, consisting of three meals a day, of the first week, to a diet of but two meals, twelve hours apart, though alike both in quantity and kind of food taken, during the second week, produced a slight feeling of malaise, and some constipation.

This stated diet was continued during the periods given in Tables (3) and (4) but the amount of study was varied. First, it was increased about four hours a day above the amount in the previous periods; the result of this change is given in Table (3). Then, both study and recitations were entirely discontinued, and various means of recreation, requiring little or no mental effort, were substituted. The effect of this diminished study is given in Table (4).

In September the experiments upon the influence of mental labor were repeated; and as before, a regular diet, consisting of two meals a day, twelve hours apart, was adopted. Each meal now consisted of—

Beef	4 oz.	=	113.2 grams.
Bread	4 "	=	113.2 "
Beans	1 "	=	28.3 "
Water	16 "	=	452.8 "
	25 oz.	=	707.5 grams.

During the first period—the results of which are given in Table (5) —the time of study was greatly increased above the accustomed amount. During the second period—given in Table (6)—all study was abandoned, and the time spent in recreation.

This experiment was again repeated in November. Table (7) gives the excretion during the period of greatest mental activity. I was at that time attending lectures and recitations during six hours each day, and was engaged in hard study for an average of three hours a day in addition. The last four days were taken as vacation and the time was devoted to pleasure and rest from study. The effect of this period is given in Table (8).

Table (9) is a summary of the averages of the whole series of experiments; the day being divided into two periods of twelve hours each, thus making the whole average agree with the last experiments.

On comparing Tables (1) and (2), in which the amount of study was essentially the same, but the diet was different—being the ordinary one of three meals a day in the first, and in the second, consisting of two precisely similar meals taken twelve hours apart—it appears that there is in each a considerable variation in the amount of phosphoric acid excreted from day to day; and this whether the quantity be considered as a whole, or viewed as separate portions in combination with alkaline or with earthy bases.

In the first period the alkaline phosphates are most abundant in the afternoon, and steadily decrease till the morning, when the average appears to be less than in any other portion of the day.

The earthy phosphates are present in the greatest quantity during the hours of the forenoon, and are least during that portion of the night which is spent in sleep. In the second period, the alkaline phosphates average rather more during the forenoon than during any other part of the day. This seems to be an exception to the general rule, however, for in each of the other periods this exacerbation appears later in the day. The earthy phosphates are in largest quantity during the evening, and least during the hours of sleep.

The excretion of phosphoric acid appears to be much more regular when the diet is regular, than when it is subject to the variations of the ordinary mixed diet.

The results, when the amount of time spent in hard study was much increased above the amount usually so employed, are given in Table (3); the diet being the same as in Table (2). While in Table (4), the opposite condition was present—all study and other causes of mental exertion being avoided.

Comparing these two Tables, it will be noticed that the alkaline phosphates are in larger amount when the study is increased, the difference being about 15 per cent; this increase taking place in the daytime, while during the night the average is rather less. The amount of *earthy* phosphates is greatest when there is no study, the increase being about the same day and night, and amounting to about 20 per cent. The *total* phosphates do not differ materially in the two Tables; though their amount is somewhat more in the one in which there is most study.

Tables (5) and (6) represent essentially the results of the same conditions as the two which precede it, Table (5) being the period of mental labor, and Table (6) the one of mental relaxation. The earthy phosphates, as in the preceding experiments, are increased during the period of mental relaxation; though the difference is greater than before, the increase being about 40 per cent during the day, and about 20 per cent during the night.

The amount of exercise taken was about the same in each of these periods; as also was the amount of sleep, which was about eight hours in the twenty-four. The only difference in the conditions was the amount of study. During the periods of greatest mental work, six hours were devoted to hard study and two hours to recitation each day, while during the periods of rest, all study and recitation were abandoned, and the time, which had been before given to these, was spent in recreation and amusement, thus producing much difference in the activity of the mind.

In both instances, increased work diminished the excretion of earthy phosphates. The alkaline phosphates were increased in the first period of study, and not altered in the second. Thus making the total amount of phosphoric acid excreted about the same, whether the mind be active or not.

The experiments recorded in Tables (7) and (8) were conducted upon an ordinary mixed diet. During the first four days, Table (7), six hours each day were spent attending lectures and recitations, and an average of three hours more devoted to hard study. The last four days, Table (8), were during vacation, and the time was spent in amusement and recreation, the amount of sleep, as before, being eight hours. By thus diminishing the mental labor, the earthy phosphates are increased 20 per cent. during the day, and 12 per cent. during the night. While under these conditions, the alkaline phosphates are diminished 15 per cent. during the day, and remain the same during the night.

Comparing the last six tables, which give the results of the three series of experiments, with each other, they are found to have the following results in common: 1st, The amount of *earthy* phosphates excreted is smallest during the periods of study, the difference being from 20 to 40 per cent. during the day, and from 12 to 20 per cent. during the night. 2d, The *alkaline* phosphates do not follow so constantly the same law in each case, yet they always vary in the same direction. They increase on increasing the amount of study in the first and third series, and in the second series are not altered, as the increase during the first part of the day is made up during the afternoon; and as the increase during the evening equals the decrease of the night. The average increase is about 15 per cent. during the day; but no change appears during the night.

The total amount of phosphoric acid is irregular, being sometimes more and at others less, during the periods of study; this amount being evidently the sum of the variations of the alkaline and earthy phosphates.

The most marked result obtained in these experiments, is the *great increase* of *earthy* phosphates whenever mental activity is *diminished*. This fact is constant in the whole series. Both nervous and cerebral tissue are rich in phosphorus, and this when oxidized will yield phosphoric acid; hence, *ceteris paribus*, most phosphoric acid will be found in the blood, and consequently in the urine, when these tissues are most rapidly undergoing oxidation. From this it follows that if increased activity of the organs containing these tissues, gives rise to increased disintegration and oxidation of them, the products of this oxidation would be increased in the urine; and hence, that the total phosphoric acid would be thus increased. But on the contrary if this activity consists in a more rapid growth and less decay of these tissues, then there would be found less phosphoric acid in the urine. The total amount of phosphoric acid excreted, however, does not appear, in these experiments, to be altered by changing the mental condition, sufficiently to draw any positive conclusions; but when it is separated according to whether it is combined with alkaline or with earthy bases, we find it to be greatly varied by changing the amount of brain work. If we assume that the *alkaline* phosphates result from this metamorphosis, then, since they are increased by study, the disintegration of nervous tissue would be correspondingly *increased*; while if the *earthy* phosphates have this origin,

then, as they are *diminished* under these circumstances, there must be *less* oxidation of these tissues when the mind is actively engaged. Consequently it would follow that the same law which the researches of Dr. Noyes and Dr. Parkes have shown to be true of muscular tissue, namely, that it grows during a state of active exercise, is true also of nervous tissue.

Now, inasmuch as the alkaline phosphates are not increased in any proportion to the amount of increase of mental labor; while the earthy phosphates are diminished in a very much greater proportion by the same means; it seems probable that the latter of these hypotheses—that mental labor diminishes the amount of earthy phosphates excreted, and consequently that nervous tissue grows when in a state of activity—is the true one.

Dr. W. A. Hammond has published in his "Physiological Memoirs" the results of a series of analyses undertaken to determine the law of the excretion of phosphoric acid. He finds that the amount which is excreted is greatly increased on increasing the amount of study; though he only estimated the total amount of phosphoric acid, without distinguishing it according to the bases with which it was combined. Moreover his determinations were made by Liebig's method, with ferric chloride. From the results of his experiments he argues* that "the brain is seen to follow the same general law which governs the other structures of the body—increased use promotes increased decay," "intense mental labor, by accelerating the metamorphosis of the cerebral tissue, necessarily requires a renewal of that tissue, and thus the nutrient elements of the food are diverted from those parts of the body by which they would ordinarily be appropriated to that organ which so imperatively demands them." It will be seen, from what has been already stated, that my results do not agree with those of Dr. Hammond, though all the series here given agree well among themselves; indeed so far as any inference can be drawn, they prove just the opposite.

Mosler also, has made some experiments on the same subject,† in which he separated the phosphates of the earths from those of the alkalies. He found that increased study increased the total phosphoric acid one half, the alkaline phosphates less than one quarter, and the earthy phosphates one third; though how the former

* Hammond's Physiological Memoirs, Philad., 1863, page 23.
† Inaug. Diss., Giessen, 1852.

fact can be derived from the two latter and constituent facts, does not appear.

It is possible that in the experiments of Hammond and of Mosler, the mental exertion was carried to the point of fatigue, which is not true of any of the experiments recorded in this paper. If that were the case, the fact would be another link in the chain of evidence that nervous tissue follows the law governing the action of muscular tissue; and that, just as the latter, as Dr. Noyes has shown, produces an increased amount of urea in the urine only when exercised beyond the point of fatigue, so the former gives under the same conditions only, an increased excretion of phosphates.

In regard to the question whether the alkalinity of the day-urine is due to the presence of alkaline phosphates as was suggested by Dr. Noyes, it is evident that the fact that this alkalinity is found uniformly in the forenoon when the amount of alkaline phosphates is less than in any other period of the day, a fact established by my analyses, proves this conjecture to be unfounded. This fact, however, does not throw any light upon the real cause of the alkalinity. Why should it appear only in the urine passed at 1 P. M., the period which immediately follows the concentrated acid urine of the night? And this when the quantity of solids is least in proportion to the quantity of water? Moreover, why should not the urine passed at 1 A. M., a period of the day corresponding in all respects with the former, be also alkaline? Does not the fact seem to point to a tissue change either destructive or assimilative, which takes place during sleep, the products of which are excreted a few hours after rising?

The results obtained in the foregoing research may be thus summed up:—

1. The *amount of urine* excreted varies at different periods of the day, even on a fixed diet; the day-urine exceeds the night-urine in the ratio of 3 to 2. The largest amount is excreted during the forenoon, the next largest in the afternoon, then comes that of the latter part of the night, and lastly that passed in the early part of the night.

2. The *density* of the urine varies inversely as the amount of urine passed; the morning-urine having a higher specific gravity than that excreted at night.

3. The *total amount of solids* excreted is greater during the day than during the night by nearly 50 per cent.; thus showing that

the density is not diminished in proportion to the amount of urine passed.

4. The reaction of the day-urine is uniformly alkaline, that of the night-urine acid; while however, acid urine is excreted during both periods of the night, it is the morning-urine only that is alkaline, that of the afternoon being acid.

5. The total *phosphoric acid* excreted per hour on an ordinary diet, is largest during the day, rising highest after the principal meal; while on a fixed diet, the excretion is greatest at night, the maximum being reached during the first half of the night, the amount diminishing in the afternoon; it is less still at 7 A. M. and least at 1 P. M.

6. The *alkaline phosphates*, when an ordinary diet is taken, are greater by day than by night; on a fixed diet the reverse is true.

7. The *earthy phosphates*, on the other hand, are largest in amount during the day, both on ordinary and fixed diets.

8. The *total phosphoric acid* is very greatly affected by the amount and kind of food taken.

9. The *variations* in the amount of phosphoric acid, considered as a whole, are not sufficient to afford any indication of the previous mental condition.

10. The *alkaline phosphates* are only *slightly increased* on increasing the amount of mental labor.

11. The *earthy phosphates* are *diminished* under the same conditions, by an amount varying from 20 to 40 per cent.

12. *No such increase of phosphoric acid* as would be required by the theory of the disintegration of nervous tissue during action, was observed in these experiments.

13. The *alkalinity* of the day-urine is not due to the presence of alkaline phosphates in excess.

The results given in figures in the tables, are plotted in a series of nine diagrams appended to this thesis. They are intended to illustrate more clearly all the variations in the excretion of phosphoric acid,—whether considered as a whole, or divided according to its combinations with alkaline and earthy bases,—which I have observed as a result of my analyses.

On the margin of these diagrams, the day and hour at which the urine was voided, are indicated. The number of milligrams excreted per hour, is given at the left-hand margin, the scale beginning at 0, and extending to 100. The line which re-

presents the excretion differs for the different forms under which the phosphoric acid existed; the alkaline phosphates being indicated by a straight line, thus :————: the earthy phosphates by a broken line .....: while the total phosphoric acid is denoted by an interrupted line like this: — - —— - ——:

Two important facts are made apparent upon studying these diagrams. One is the great variation in each of the lines from one period to another of the same day; from which it is evident that the analyses should be made upon urine taken at equal intervals during the day. A second fact is that the variations in the total phosphoric acid, being the sum of the variations of its two forms of combination, do not at all indicate the amount of the variation of these latter; and hence that the analyses should include the determination of both alkaline and earthy phosphates.

The effect produced by changing the mental condition is exhibited more markedly in the ninth diagram, which shows the variation in the excretion for each week during each of the three series of experiments.

In conclusion, I would express my sincere thanks to Prof. George F. Barker, M.D., for many valuable suggestions, made during the progress of these researches in the Laboratory of the Medical College.

TABLE No. 1.—ORDINARY MIXED DIET, MODERATE STUDY.

Date	1 P. M. Quantity.	Sp. Gr.	Reaction	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. Acid.	Total Solids.	7 P. M. Quantity.	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. acid.	Total Solids
May	c.c.				Milligrams per hour.			Grams.	c.c.				Milligrams per hour.			Grams.
25	240	1025	Alkaline	Yellow	33.6	32.4	66.1	12.96	145	1016	Acid	Reddish-yellow.	47.1	18.1	65.2	11.13
26	315	1015	Slightly acid	Yellow.	35.3	19.1	54.4	9.45	205	1010	"	"	35.3	11.8	47.1	9.53
27	352	1009	Alkaline	Reddish-yellow	21.3	16	37.3	11.80	160	1020	Slightly acid	"	62.5	19.8	82.3	11.74
28	415	1014	"	Yellow.	33.8	33.7	67.5	12.5	240	1024	"	"	55.1	17.3	72.	11.19
29	340	1025	"	Reddish-yellow	28.5	25.5	54.	11.05	95	1031	Alkaline	"	68.	33.	76.	6.98
30	135	1030	"	Yellow.	21.8	20.7	42.	10.92	135	1022	Acid	"	50.	9.	59.	10.53
31	260	1023	"	"	45.5	26.8	71.3	10.72	240	1016	"	"	41.	24.5	65.5	10.51
Average	259	1021	Alkaline	Yellow.	33.7	24.7	64.	12.45	170	1021	Acid	Reddish-yellow.	54.7	16.5	71.2	10.93

Date	11 P. M. Quantity.	Sp. Gr.	Reaction	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. Acid.	Total Solids.	7 A. M. Quantity.	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. acid.	Total Solids
May 24	85	1032	Acid	Reddish-yellow.	36.7	17.5	68.1	8.35	365	1013	Acid	Yellow.	44.9	7.6	52.4	9.49
" 25	105	1031	"	" "	28.8	18.9	47.6	5.29	337	1013	"	Light-yellow	39.9	8.7	48.6	6.49
" 26	140	1035	"	"	30.4	43.6	73.3	8.16	314	1015	"	Yellow.	23.8	16.4	40.2	11.25
" 27	78	1027	"	" "	32.6	33.	65.6	6.72	170	1019	"	Reddish-yellow.	46.1	8.1	52.	9.73
" 28	80	1030	"	" "	23.2	35.	62.2	6.29	175	1022	"	Yellowish red.	31.9	19.6	51.5	10.19
" 29	155	1030	"	" "	42.4	25.3	67.7	10.85	240	1023		Yellow.	46.	20.3	66.3	11.85
" 30	70	1030	"	" "	66.4	17.3	83.7	6.39	145	1018		Reddish-yellow.	44.	7.9	51.9	5.46
Average	108	1029	Acid	Reddish-yellow.	47.6	26.9	69.8	6.27	201	1015	Acid	Yellow.	41.	11.	52.	9.57

TABLE No. 7.—REGULAR DIET, MODERATE STUDY.

Date.	1 P. M. Quantity.	Sp. Gr.	Reaction.	Color.	Hydrochloric Acid.	Free Hydrochloric Acid.	Total Hydrochloric Acid.	Total Solids.	7 P. M. Quantity.	Sp. Gr.	Reaction.	Color.	Hydrochloric Acid.	Free Hydrochloric Acid.	Total Hydrochloric Acid.	Total Solids.
June.					Milligrams Per hour.			Grams.					Milligrams Per hour.			Grams.
1	420	1015	Alkaline	Reddish-yellow.	66.6	1.2	75.	21.00	185	1030	Acid	Reddish-yellow.	84.6	28.1	63.	7.54
2	440	1022	"	Yellow.	61.1	11.1	93.3	23.55	110	1030	"	" "	66.7	8.1	71.6	7.60
3	390	1021	"	Reddish-yellow.	58.	16.	76.	12.80	115	1030	"	" "	76.6	5.6	82.	8.04
4	230	1025	"	Yellow.	57.4	11.1	74.6	13.20	90	1030	"	" "	80.6	13.4	94.	6.29
5	260	1024	"	"	61.4	16.	77.4	15.14	140	1026	"	" "	66.	10.3	76.3	8.48
Average.	308	1021	Alkaline	Yellow.	61.1	12.6	75.7	16.80	113	1029	Acid	Reddish-yellow.	58.6	15.2	71.8	7.97

	11 P. M.								7 A. M.							
June 1	55	1031	Acid	Reddish-yellow.	51.1	6.3	58	3.21	150	1036	Acid	Reddish-yellow.	71.1	11.1	82.4	12.59
" 2	52	1036	"	Yellowish-red.	50.7	17.3	68.1	6.28	120	1031	"	" "	80.6	7.1	87.8	8.97
" 3	30	1035		Reddish-yellow.	69.7	18.3	88.5	4.71	120	1028	"	Yellow.	62.1	6.2	67.3	6.78
" 4	80	1032		" "	53.	26.	79.	6.24	145	1038	"	Reddish-yellow.	81.2	4.5	85.5	8.14
" 5	20	1033		Yellowish-red.	52.4	15.6	67.2	5.3	150	1038	"	Yellowish-red.	54.	6.7	60.7	8.39
Average.	70	1033	Acid	Reddish-yellow.	60.5	17.3	77.8	5.58	128	1038	Acid	Reddish-yellow.	62.	7.	69.	9.31

TABLE No. 3.—REGULAR DIET, INCREASED STUDY.

1 P. M.

Date.	Quantity.	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. Acid	Total Solids.
June	c.c.				Milligrams per hour.			Grams.
8	353	1021	Alkaline	Yellow.	40.2	21.8	62	11.97
9	291	1022	"	"	35.8	13.	50.8	13.39
10	185	1027	Acid	Reddish-yellow	44.4	14.8	59.2	5.69
11	389	1023	Alkaline	Yellow.	39.6	8.5	48.1	13.88
12	348	1023	"	"	31.	10.4	41.4	12.50
13	315	1024	"	"	20.	20.	40.	13.34
Average.	247	1023	Alkaline	Yellow.	35.6	15.1	51.7	13.32

7 P. M.

Quantity.	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. Acid	Total Solids.
				Milligrams per hour.			Grams.
160	1020	Neutral	Reddish-yellow.	68.	18.	74.	11.19
156	1020	Acid	" "	49.1	16.3	65.3	9.89
100	1020	"	" "	49.7	17.3	67.	6.89
150	1023	"	" "	64.3	10.7	75.	12.53
130	1026	Slightly acid	Yellow.	58.2	9.7	67.9	7.97
110	1020	Acid	Reddish-yellow.	55.	16.6	71.6	8.28
139	1025	Acid	Reddish-yellow.	64.1	15.4	69.5	9.44

11 P. M.

June 8	78	1032	Acid	Yellowish-red.	58.1	21.5	16.0	5.23
" 9	159	1030	"	" "	48.3	11.7	60.	7.69
" 10	65	1034	"	" "	53.2	15.5	70.7	8.16
" 11	85	1030	"	Reddish-yellow	54.4	27.6	82.	7.13
" 12	90	1033	"	" "	49.1	9.6	58.7	6.97
" 13	90	1030	"	" "	76.	18.3	94.3	8.19
Average.	88	1032	Acid	Yellowish-red.	56.6	17.	73.6	6.65

7 A. M.

174	1029	Acid	Yellowish-red.	50.6	7.	63.6	8.83
72	1028	"	" "	41.9	7.8	49.7	8.21
146	1026	"	" "	52.2	3.3	55.5	6.45
116	1031	"	Reddish-yellow.	43.5	6.3	49.8	7.94
110	1025	"	" "	40.7	5.1	45.8	6.61
178	1028	"	" "	66.	13.	79.	8.15
114	1029	Acid	Reddish-yellow	49.5	9.5	59.7	7.51

TABLE No. 4.—REGULAR DIET, NO STUDY.

Date.	1 P. M. Quantity.	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. Acid.	Total Solids.	7 P. M. Quantity.	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. Acid.	Total Solids.
June					Milligrams Per Ounce.			Grams.					Milligrams Per Ounce.			Grams.
14	175	1018	Alkaline	Reddish-yellow.	21.2	10.8	32.	10.19	85	1016	Acid	Reddish-yellow.	30.9	11.6	42.5	5.94
15	150	1015	"	" "	20.1	8.3	28.4	10.00	100	1018	"	" "	44	13.5	57.5	8.89
16	190	1023	"	Yellow.	20.5	13.5	34.0	10.18	90	1020	"	" "	48.1	9.7	57.8	9.49
17	120	1017	"	"	20.6	16.7	37.3	11.30	135	1018	"	" "	49.5	33.5	83.5	7.30
18	205	1026	"	"	27.6	23.4	51.0	12.61	115	1032	"	"	38	21	59.	8.57
Average.	140	1020	Alkaline	Yellow.	27.8	16.9	44.7	11.01	113	1029	Acid	Reddish-yellow.	42.3	19.4	61.7	7.45

Date.	11 P. M. Quantity.	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. Acid.	Total Solids.	7 A. M. Quantity.	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. Acid.	Total Solids.
June 15	65	1035	Acid	Reddish-yellow.	70.2	21.9	92.1	4.84	120	1027	Acid	Reddish-yellow.	39.6	9.9	49.5	7.55
" 16	84	1025	"	" "	58.2	8.3	66.5	6.29	125	1025	"	" "	50.	8.	58.	7.28
" 17	78	1028	"	" "	45	5.6	51.6	4.55	95	1027	"	Yellow.	42.6	8.5	51.	6.97
" 18	50	1029	"	" "	78.3	13.3	91.6	6.15	150	1030	"	Reddish-yellow.	50.	25.	75.	10.84
" 19	72	1034	"	" "	50.7	20.	70.7	5.34	160	1034	"	" "	66.5	29.5	96.	7.92
Average.	70	1030	Acid	Reddish-yellow.	61.1	14.8	75.4	5.43	110	1029	Acid	Reddish-yellow.	50.3	14.6	64.9	7.51

TABLE No. 5.—REGULAR DIET, INCREASED STUDY.

1 P. M.

Date.	Quantity.	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. Acid.	Total Solids.
	c.c.				Milligrams Per Hour.			Grams.
Sept. 6	165	1035	Acid	Yellow.	50.8	13.8	46.	25.46
" 8	210	1026	"	"	33.7	6.	44.7	16.24
" 9	180	1028	"	Reddish-yellow	38.3	7.8	45.7	21.76
" 10	175	1027	"	" "	28.8	9.2	38.	21.
" 11	180	1027	"	" "	39.6	8.8	48.5	21.32
" 12	175	1028	"	" "	49.9	12.6	63.5	21.42
Average.	180	1027.	Acid	Reddish-yellow.	35.4	9.7	48.1	21.83

7 P. M.

Quantity.	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alkaline Phos.	P_2O_5 as Earthy Phos.	Total Phos. Acid.	Total Solids.
c.c.				Milligrams Per Hour.			Grams.
85	1032	Acid	Reddish-yellow.	12.7	4.4	38.1	5.94
165	1031	"	" "	52.9	8.8	61.1	7.58
145	1030	"	" "	54.	8.3	62.3	10.13
95	1033	"	" "	41.6	5.8	47.3	7.30
80	1036	"	" "	45.	8.1	53.1	6.99
95	1036	"	" "	37.	11.8	48.8	6.64
102	1031	Acid	Reddish-yellow.	37.3	8.2	45.5	7.31

11 P. M.

Sept. 7	60	1033	Acid	Reddish-yellow.	12.3	4.7	16.1	4.39
" 8	50	1030	"	" "	18.2	10.2	28.4	6.29
" 9	110	1031	"	" "	40.6	5.4	46.1	7.94
" 10	55	1032	"	" "	39.2	10.8	50.	7.18
" 11	100	1032	"	" "	31.7	14.4	45.1	7.45
" 12	78	1032	"	" "	19.7	12.	32.3	4.92
Average.	69	1031	Acid	Reddish-yellow.	27.3	9.7	37.	6.45

7 A. M.

100	1025	Acid	Reddish-yellow.	25.7	22.3	45.	6.16
105	1028	"	" "	26.1	7.9	44.	7.68
135	1029	"	" "	37.4	7.3	44.7	8.85
135	1029	"	" "	30.8	12.7	43.5	7.77
115	1028	"	" "	32.9	12.6	45.5	7.77
88	1029	"	" "	39.	6.3	45.3	5.40
103	1029	Acid	Reddish-yellow.	31.	11.5	43.5	6.94

TABLE No. 4.—REGULAR DIET, NO STUDY.

Date	1 P. M. Quantity	Sp. Gr.	Reaction	Odor	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. acid	Total Solids.	7 P. M. Quantity	Sp. Gr.	Reaction	Odor	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. acid	Total Solids.
Sept.	c.c.				Milligrams per hour.			Grams.					Milligrams per hour.			Grams.
14	159	1026	Acid	Reddish-yellow	13.	12.9	25.9	9.09	168	1031	Acid	Reddish-yellow	13.8	14.8	28.6	7.55
15	240	1025	"	" "	30.4	13.7	43.1	10.53	156	1029	"	" "	30.9	16.6	47.4	10.29
16	180	1025	"	" "	41.8	8.7	50.5	12.97	160	1028	"	" "	48.2	3.9	52.1	10.76
17	240	1026	"	" "	39	6.8	45.8	14.64	220	1025	"	" "	37.5	8.1	45.6	11.69
18	180	1028	"	" "	43.2	2.4	45.6	11.21	180	1030	"	" "	47.	25.6	72.6	10.48
19	175	1027	"	" "	34	16.6	50.6	11.	175	1025	"	" "	63.9	22.3	86.2	11.43
Average.	197	1026	Acid	Reddish-yellow	32.	11.	43.	12.03	161	1028	Acid	Reddish-yellow	40.4	16.4	56.8	10.63

Date	11 P. M. Quantity	Sp. Gr.	Reaction	Odor	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. acid	Total Solids.	7 A. M. Quantity	Sp. Gr.	Reaction	Odor	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. acid	Total Solids.
Sept. 14	135	1031	Acid	Reddish-yellow	28.2	18.4	46.6	7.34	95	1036	Acid	Reddish-yellow	27.7	6.3	34.0	5.33
15	85	1031	"	" "	48.2	15.	58.3	5.98	110	1034	"	" "	31.9	13.2	44.4	7.65
16	125	1030	"	" "	30.1	13.3	43.4	8.73	120	1028	"	" "	27.2	10.3	37.5	7.68
17	140	1028	"	" "	42.5	10.6	53.1	13.29	100	1029	"	" "	31.4	8.2	39.6	6.35
18	100	1034	"	" "	31.8	9.2	41.0	7.35	90	1032	"	" "	28.	12.9	40.9	7.08
19	120	1031	"	" "	31.3	25.6	56.9	8.89	120	1028	"	" "	25.2	13.1	38.3	7.93
Average.	117	1031	Acid	Reddish-yellow	31.3	14.3	48.7	8.71	107	1028	Acid	Reddish-yellow	31.9	10.9	42.9	7.10

TABLE No. 7.—MIXED DIET, HARD STUDY.

Date.	7 A. M. Quantity	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. acid.	Total Solids.	7 P. M. Quantity.	Sp. Gr.	Reaction.	Color.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total phos. acid.	Total Solids.
Nov.	c.c.				Milligrams Per hour.			Grams.					Milligrams Per hour.			Grams.
12	380	1021	Acid	Reddish-yellow.	27.7	16.4	43.1	13.35	402	1015	Alkaline.	Reddish-yellow.	38.1	26.2	64.3	25.34
13	395	1022	"	" "	25.1	17.3	42.4	18.24	380	1016	"	" "	36.4	22.1	57.5	23.02
14	395	1026	"	Yellowish-red.	28.9	14.1	43.	14.32	400	1023	"	" "	33.	21.4	56.4	23.38
15	402	1025	"	" "	34.5	13.3	47.8	13.80	390	1024	"	" "	36.6	15.9	51.5	18.35
Average.	243	1027	Acid	Reddish-yellow.	41.5	18.2	47.7	14.59	374	1025	Alkaline.	Reddish-yellow.	34.3	20.1	54.4	22.48

TABLE No. 8.—MIXED DIET, NO STUDY.

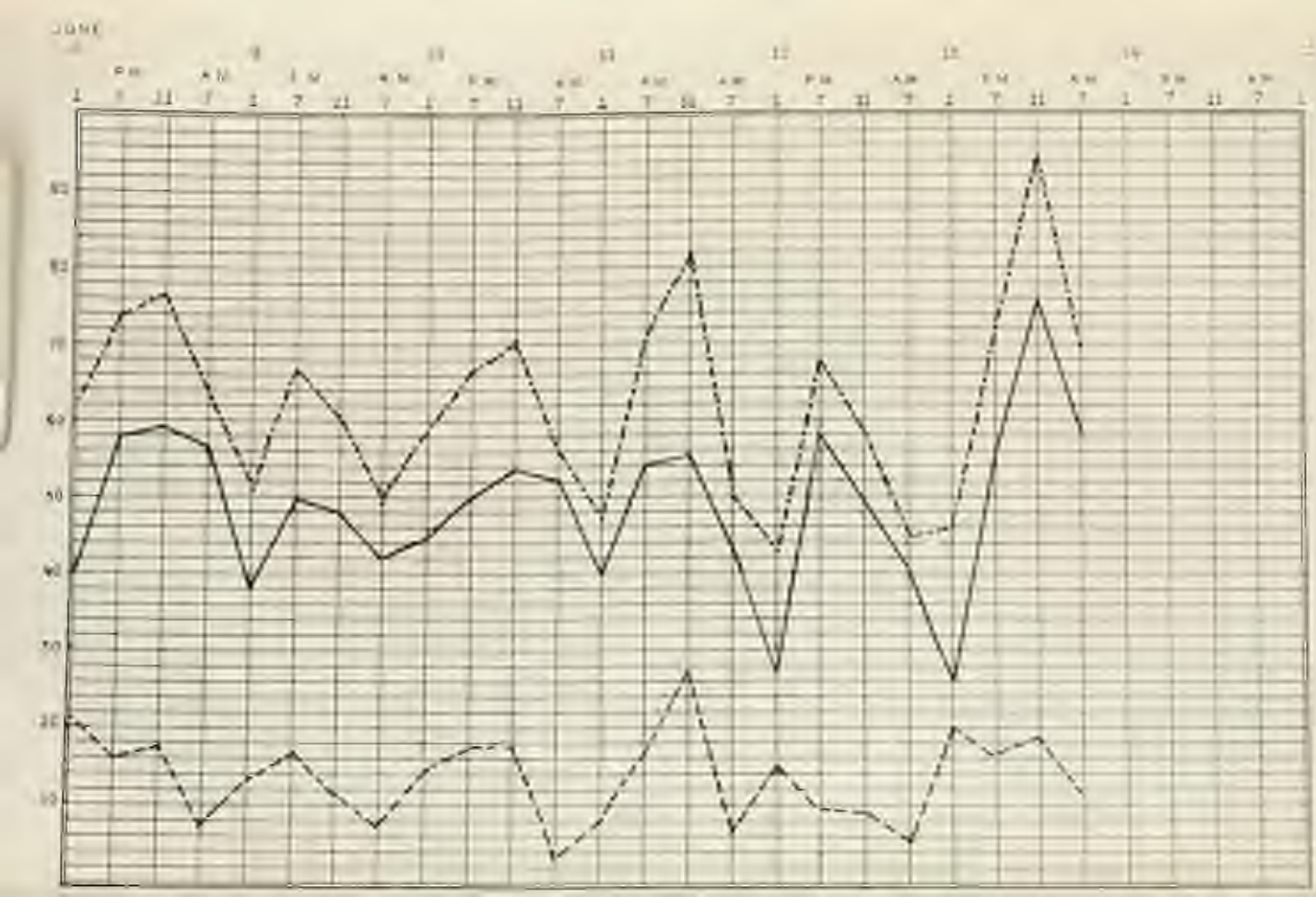
Nov.	7 A. M. c.c.								7 P. M.							
23	160	1030	Acid	Yellowish-red.	35.	17.3	52.3	13.00	350	1030	Alkaline.	Yellow.	36.5	23.5	58.	24.16
24	240	1032	"	Reddish-yellow.	24.1	15.5	39.6	10.27	345	1021	Slightly acid	Reddish-yellow.	21.1	22.6	43.3	24.03
25	310	1026	"	" "	23.4	15.8	39.2	12.72	275	1027	Alkaline.	Yellow.	19.9	21.3	41.2	17.60
26	410	1024	"	" "	43.6	20.9	73.5	26.75	333	1032	"	"	41.8	32.	78.3	28.48
Average.	284	1030	Acid	Reddish-yellow.	31.3	19.1	50.9	15.1	301	1029	Alkaline.	Yellow.	29.4	25.8	55.2	24.19

TABLE No. 9.—AVERAGE OF EACH WEEK FOR THE WHOLE SERIES.

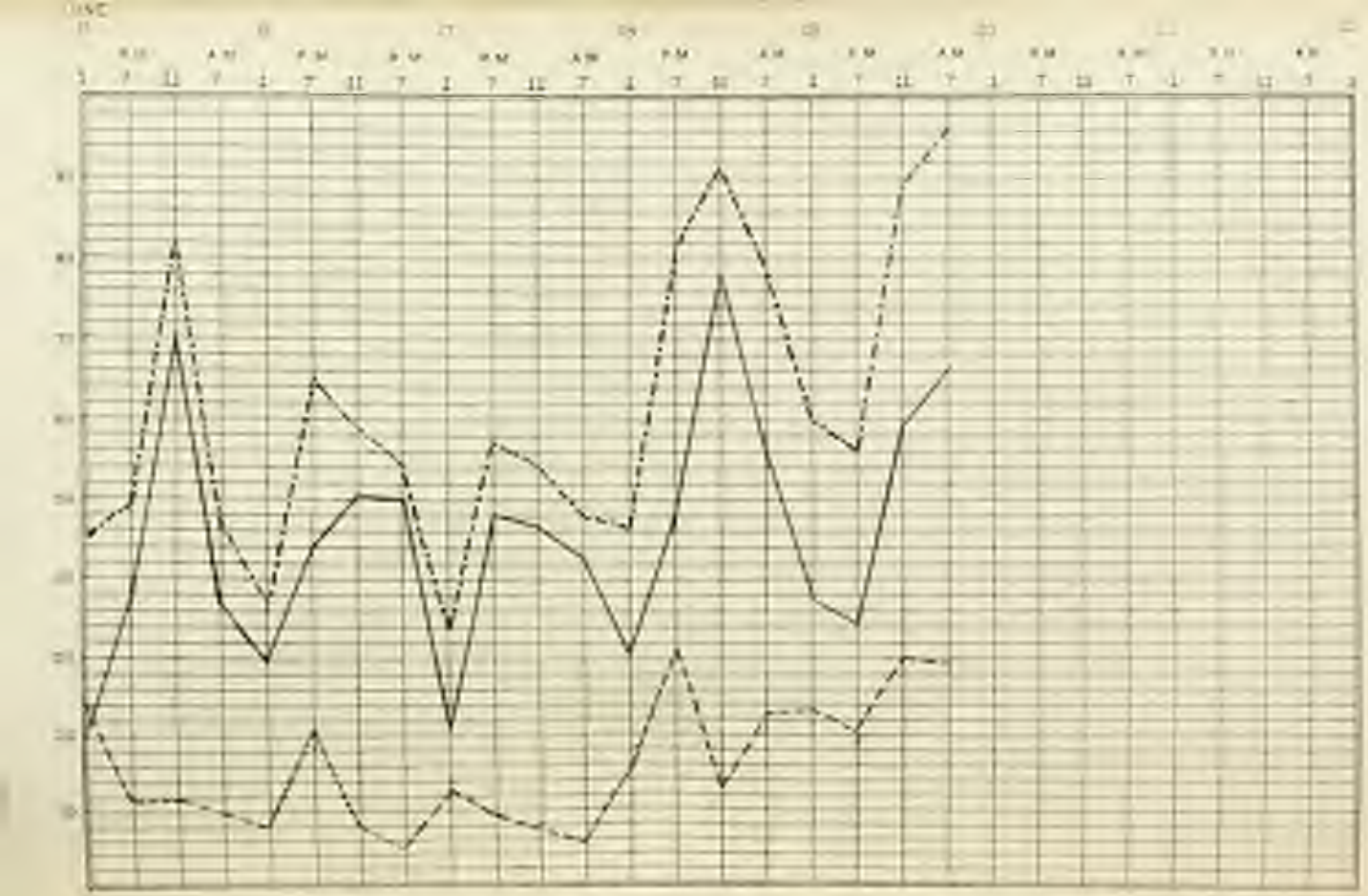
Table.	7 P. M. Quantity.	Sp. Gr.	Reaction.	Odour.	P_2O_5 as Alk. Phos.	P_2O_5 as Earthy Phos.	Total Phos. acid.	Total Solids.	7 A. M. Quantity.	Sp. Gr.	Reaction.	Odour.	P_2O_5 as Alkaline Phos.	P_2O_5 as Earthy Phos.	Total Phos. acid.	Total Solids.
					Milligrams Per Hour.			Grms.					Milligrams Per Hour.			Grms.
1	455	1028	Alkaline	Reddish-yellow.	47.	10.6	57.6	22.97	364	1014	Acid	Reddish-yellow.	44.5	14.9	59.4	16.14
2	430	1026	Alkaline	Reddish-yellow.	61.8	13.4	75.2	24.77	311	1011	Acid	Reddish-yellow.	61.2	13.3	74.4	15.18
3	340	1026	Alkaline	Reddish-yellow.	44.3	15.6	60.4	22.36	194	1009	Acid	Reddish-yellow.	52.7	13.1	64.8	13.68
4	281	1027	Alkaline	Reddish-yellow.	33.	14.1	51.1	18.64	197	1009	Acid	Reddish-yellow.	55.1	14.5	70.3	23.39
5	302	1029	Acid	Reddish-yellow.	38.4	8.3	46.7	19.84	191	1010	Acid	Reddish-yellow.	32.1	13.6	45.7	13.48
6	360	1025	Acid	Reddish-yellow.	36.2	13.2	49.4	21.71	234	1010	Acid	Reddish-yellow.	33.1	12.7	45.8	15.85
7	374	1028	Alkaline	Reddish-yellow.	34.3	23.1	57.4	22.85	244	1027	Acid	Yellowish-red.	31.5	16.1	47.7	14.94
8	381	1028	Alkaline	Yellow.	29.4	25.3	54.7	24.33	236	1010	Acid	Reddish-yellow.	31.9	16.7	48.6	17.1

No 1 ORDINARY MIXED DIET MODERATE STUDY

No 2 REGULAR DIET, MODERATE STUDY



No. 5 REGULAR DIET, INCREASED STUDY

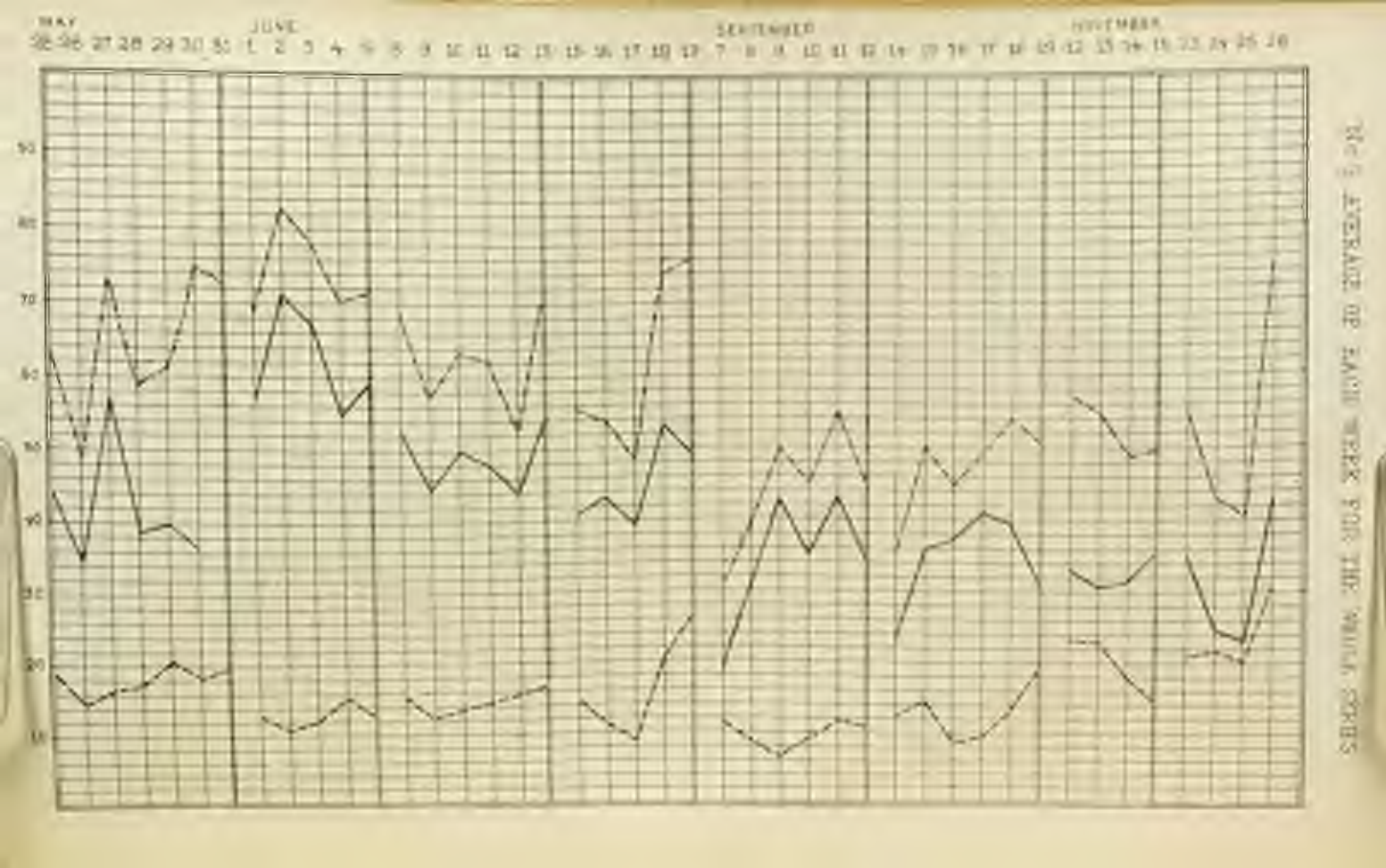


N/A REGULAR DIET, NO STUDY

No 5 REGULAR DIET, INCREASED STUDY

DAY 5 REGULAR DIET, NO STUDY

No7 MIXED DIET HARD STOOL
No8 MIXED DIET NO STUDY


MAY
JUNE
SEPTEMBER
OCTOBER

ARTICLE XII.

THE USE AND ABUSE OF SPECTACLES.

Being the Annual Dissertation read before the Convention, May 20th, 1868.

BY CHARLES M. CARLETON, M. D., OF NORWICH.

There are few subjects connected with the practice of medicine and surgery more important or less understood, by the mass of the profession, than the selection of spectacles. Our knowledge of the affections of the eye, arising from the anomalies of refraction and accommodation, has been greatly increased during the last few years. Many diseases which were formerly considered incurable, are now found to be perfectly amenable to treatment. This change is due chiefly to the researches of Helmholtz, Von Graefe, Donders, Bowman, Liebreich, Wecker, and a few others. Their zeal has been untiring, and the world, as well as the profession, owes them an endless debt of gratitude.

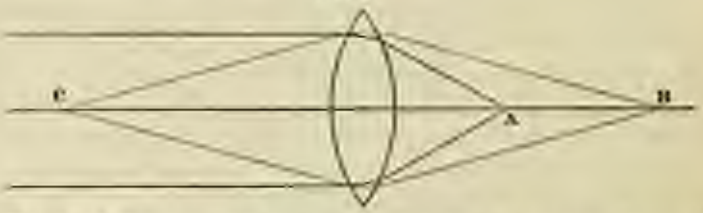
I will cite one class of cases familiar to all; that of over-worked students. How frequently do they consult us, in regard to eyes apparently healthy, complaining that they can read only for a few minutes at a time without everything becoming blurred. "The letters dance before their eyes," and, if they persist in their work, an intolerable nervous pain through the orbits and temples obliges them to close their eyes and rest. They anxiously ask if they are in danger of becoming blind. This question was, formerly, very frequently answered in the affirmative. The patient was condemned to wear green glasses or a shade, to go out of doors only after sundown, and on no account allowed to use his eyes for reading or any fine work for a period of six months or a year. The disease was variously called Irritability of the Retina, Retinitis, Choroiditis, Incipient Amaurosis, &c., &c. Donders has demonstrated beyond a question that this troublesome affection (Asthenopia) is, in nearly all cases, due to Hypermetropia and easily cured by the proper use of glasses, without loss of time to the patient while under treatment.

Spectacles should in all cases be selected by an oculist, or at least by a physician possessed of specific knowledge on the subject. A case of trial glasses, consisting of a complete set of convex and concave spherical and cylindrical lenses, prisms, tinted glasses, and stenopaic apparatus, is an indispensible requisite. No jeweler or mere optician should ever be entrusted with so delicate and important a task. An injudicious selection frequently ruins eyes that might by proper treatment be rendered useful. To make a proper selection of glasses in any and all cases, it is necessary that the practitioner should thoroughly understand: 1. The properties of optical lenses. 2. The eye as an optical instrument. 3. The anomalies of refraction and accommodation of the eye. Let us consider these in their numerical order.

THE PROPERTIES OF OPTICAL LENSES.

The lenses in most general use as aids to vision are the spherical biconvex and biconcave, with the radii of curvature of the two surfaces equal. Rays of light passing through the centre of either of these lenses are not deflected. Parallel rays, emanating from an object at an infinite distance* falling upon a biconvex lens are united at a certain point behind the lens (A, Fig. 1,) which point is called the focal point or principal focus.

Fig. 1.

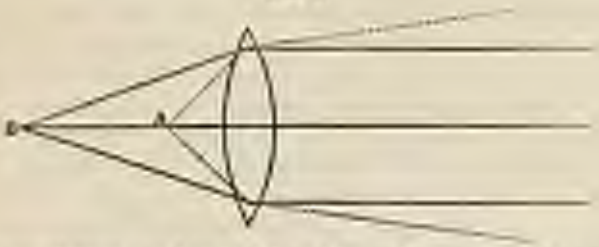


The focal distance of simple biconvex and biconcave lenses is nearly equal to the radius of curvature of the lens. The fact that convex and concave lenses of equal power exactly neutralize each other, furnishes us with an easy method of determining the power of any given lens. Thus if the lens be convex, we neutralize it with a concave lens from the trial case, and the number of the concave glass will give that of the convex.

* An object is considered, by oculists, to be at an infinite distance when the rays emanating from it fall upon the eye so nearly parallel that the divergence is imperceptible, which obtains at a distance of about eighteen or twenty feet.

Convergent rays are brought to a focus at a point (A. Fig. 2,) between the principal focus and the lens.

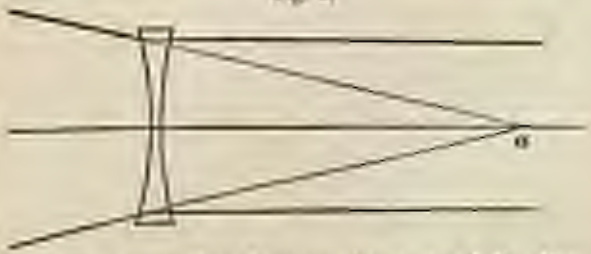
Fig. 1.



Divergent rays are brought to a focus at a greater distance from the lens than the principal focus, unless they emanate from an object situated at the same or a less distance from the lens than the principal focus, when the lens will only have the power of rendering them parallel or less divergent. (See Fig. 2.) Rays emanating from an object at twice the focal distance from the lens, are brought to a focus at the same distance on the other side of the lens. Rays emanating from an object situated at B (Fig. 1,) are brought to a focus at C. If the position of the object be changed to C, rays emanating from it will be brought to a focus at B. Any two points thus dependent upon each other, are called conjugate foci.

Biconcave lenses render parallel rays divergent. On leaving the lens they assume a direction as if they emanated from a point nearer the lens. Parallel rays passing through a biconcave lens of six inch focus appear to emanate from a point six inches in front of the lens. This point, (Fig. 3, a) where the deflected rays, if prolonged backwards through the lens, would intersect each other, is called the negative virtual focus. It is an imaginary one being situated on the same side of the lens as the object.

Fig. 2.



Divergent rays, emanating from an object at a finite distance, are rendered more divergent, and have their imaginary focus nearer the lens than the principal focus.

Beside the glasses described above we have the concavo-convex or positive menisci, convexo-concave or negative menisci, the cylindrical convex and concave lenses, prisms, and tinted glasses. The plano-convex and plano-concave should never be used for spectacles, as, for an equal degree of power, they have more aberration than biconvex and biconcave glasses. The menisci (periscopic glasses) have the least aberration for very oblique rays. Therefore objects viewed obliquely through them are less distorted than when seen under similar circumstances through any other glass. For this reason they are, in most cases, to be preferred to the simple biconvex and biconcave lenses, except where very high power is required, when their greater weight is a disadvantage.

All the lenses described thus far are spherical lenses; i. e. they are segments of spheres and refract equally all rays which fall upon them in all the planes of the segment. Besides these it is frequently necessary to have recourse to cylindrical lenses; i. e. lenses which are segments of a cylinder and which refract those rays strongest, which fall upon them in a plane at right angles to the axis of cylindrical curvature. The refraction grows less and less towards the cylindrical axis, at which point none occurs.

In certain forms of impaired vision, prisms are indicated rather than lenses. It is sometimes necessary to combine the two. The action of the prism is to refract all rays passing through it towards its base.

Tinted glasses are used for modifying the light, in cases where ordinary daylight cannot be endured. Green glasses were formerly recommended on the supposition that the red rays of the solar spectrum were those which irritated the retina. It is now a settled fact that not the red but the orange rays have this effect. Blue excludes the orange rays, and is, therefore, the proper color to be employed. Furthermore as blue occupies a more excentric position in the solar spectrum, it makes less impression upon the retina. Smoke-glasses should never be used, as they diminish the whole volume of light, and thereby render the image less distinct.

Goggles and eye-protectors are much too frequently used. The former cover best the eye and should never be worn except when, soon after a severe operation, the eye is inflamed and peculiarly susceptible to cold. The latter possess the same disadvantage, but in a less degree. In most cases where anything of this character is required, the light or medium blue curved eye protectors (coquilles) are the best. It is sometimes necessary to combine the blue tint with a refracting power. If the power required be low, the

lens may be cut from tinted glass, but in high powers the varying thickness of the lens causes a considerable difference in the tint, in the centre and at the edges of the glass, which confuses the vision. In such cases Mr. Lawrence, of London, recommends the joining of very thin plates of tinted glass, by means of Canada balsam, to the backs of plano-concave and convex lenses.

THE EYE AS AN OPTICAL INSTRUMENT.

The eye may be regarded as a camera obscura with a concave screen, the retina, upon which is formed a diminished and inverted image of the object.

The dioptric system of the eye consists of the cornea, aqueous humor, crystalline lens and vitreous humor; conjointly they act as a biconvex lens, and bring parallel rays, in the normal eye, to a focus upon the retina. The cornea and aqueous humor may be considered as presenting only one refracting surface, on account of the parallelism of the two surfaces of the cornea, and the fact that the two media possess very nearly the same refractive power. The refraction of the vitreous humor is nearly the same as that of the aqueous. The lens is by far the most powerful refracting medium in the eye, without it parallel rays would not be brought to a focus upon the retina but behind it.

The optic axis is an imaginary line (*a b* Fig. 4) drawn from the centre of the cornea to a point lying midway between the optical disc and the macula lutea.

Fig. 4.

The visual line is an imaginary line drawn from the object to the macula lutea (Fig. 4 *c, d,*), for as the macula lutea is the most sensitive portion of the retina, it is always, in the normal eye, directed towards the object.

The visual line and optic axis are not, therefore, identical, as was formerly supposed, but cross each other at the nodal point (*b*, Fig. 4). The angle formed by their intersection at the nodal point is, in the normal eye, one of about 5 degrees. In hypermetropic eyes it is greater, often amounting to 8° or 9° which gives

rise to apparent divergent strabismus. In myopia it is less, or the two lines may even be identical. The nodal point, where all the rays of direction cut each other, is situated in the lens near its posterior surface (Fig. 4, *k*).

We come now to treat of the accommodation of the normal eye. Parallel rays, emanating from an object at an infinite distance, falling upon the normal emmetropic eye, when at rest, are brought to a focus on the bacillar layer of the retina. Now if the object be brought nearer to the eye the rays emanating from it will become divergent, and will not be brought to a focus upon the retina but behind it, unless the refracting power of the eye be increased.

Many theories have been advanced as to what changes the eye undergoes in the accommodation for near objects. Some have claimed that the cornea becomes more convex; but Helmholtz has proved, by his opthalmometre, that the cornea undergoes no change during accommodation. Others have thought that the recti muscles, by changing the form of the ball, assist in the accommodation, but in a case reported by Von Graefe, where all the recti and obliqui muscles were paralysed, so that the eyes were perfectly immovable, the accommodation was perfect.

At about the same time, Helmholtz and Cramer (working independently of each other) demonstrated the fact, that the change in the refraction of the eye during accommodation is wholly due to an alteration in the form of the lens. Helmholtz found that the lens did not change its position, but that the convexity of its two surfaces was increased, thereby shortening its focal distance. He found by calculations that these changes were sufficient for all accommodative purposes.

On holding a lighted candle before the eye during accommodation for near objects, the reflex image from the cornea remains unchanged, whilst that from the anterior surface of the lens diminishes in size and approaches the corneal image; the image from the posterior surface of the lens diminishes slightly in size, but does not change its position.

The next question necessary to decide is, how this change in the form of the lens is produced. The changes have been considered as the result of the combined action of the iris and ciliary muscle. Some physiologists giving the prominence to the iris and others to the ciliary muscle. Cramer thought the change was brought about through the agency of the iris, the ciliary muscle

acting only as a support to the lens, preventing its dislocation backwards under the pressure of the iris. Donders agrees for the most part with Cramer, but says further: "I consider the ciliary muscle just as important for the change in the form of the lens as the muscular fibres of the iris; without it the iris would not be able to exert a pressure of any importance upon the lens." Helmholtz gives more importance to the action of the ciliary muscle than either Cramer or Donders, but considers that the iris plays the most important rôle in changing the form of the lens. Heinrich Müller, on the other hand, attaches greater importance to the action of the ciliary muscle than to that of the iris.

It has fallen to the lot of Von Graefe to decide this important question. A case occurred in his clinique in which, after the removal of the entire iris, the power of accommodation remained unimpaired, but became paralysed, on paralyzing the ciliary muscle, by the instillation of a strong solution of atropia.

RANGE OF ACCOMMODATION.*

By this term is understood the distance between the farthest and nearest points of distinct vision. In the normal eye, at puberty, the nearest point of distinct vision lies at about 2½ or 4 inches from the eye, and the farthest at infinite distance. These limits vary with the age of the patient. In determining the situation of the near and far points, the size of the object must be considered, as well as the distance at which it can be seen. An object cannot be distinctly seen under an angle of less than five minutes; i. e., the external rays emanating from an object must, by their intersection at the nodal point, form an angle of at least 5 minutes. Snellen has made his test-types, for determining the range of accommodation, in accordance with this fact. The

* The following symbols and abbreviations are used in the course of this dissertation for the sake of brevity:
V acuteness of vision.
A or $\frac{1}{p}$ range of accommodation.
∞ infinite distance.
p punctum proximum (near point).
r punctum remotissimum (far point).
P distance from *p* to eye.
R distance from *r* to eye.
E emmetropia.
H hypermetropia.
M myopia.
h horizontal meridian.
v vertical meridian.
+ (used in connection with a lens) indicates positive power (CONVEX lens).
— indicates negative power (concave lens).

letters are square and their size increases at a definite ratio, so that each number is seen under an angle of 5′ at a distance corresponding in feet to the number of the type. Thus, No. 1 is seen by a normal eye up to a distance of one foot, No. 2 at 2 feet, and so on.

If the eye is not possessed of normal acuteness of vision, it will require to see the letters under a greater angle than 5′. No. XX (Fig. 5) cannot be read at 20 feet, but only, perhaps, at 15 or 10 feet.

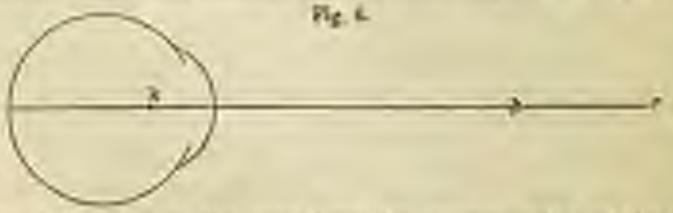
Fig. 5.

Snellen's Test Types, No. XX.

To calculate the degree of acuteness of vision, (V) divide the distance at which No. XX can be recognized (d) by the distance at which it appears under an angle of 5′ (D) thus: $V=\frac{d}{D}$.

If No. XX is visible at 20 feet; d and D are equal and the acuteness of vision is normal, $V=\frac{20}{20}=1$. If No. XX is only visible within 10 feet, $V=\frac{10}{20}=\frac{1}{2}$. The distance of p from the nodal point of the eye (P) and the distance of r from the same point (R) being known, the range of accommodation (A) may be easily found by the formula $\frac{1}{A}=\frac{1}{P}-\frac{1}{R}$, which is thus explained by Donders, its inventor: "In this formula, A is the focal length of a lens, which

Fig. 6.



gives a direction to the rays from the nearest point of distinct vision p, as if they came from the farthest point r. The subjoined figure (6) illustrates this. The eye in the condition of rest is

accommodated for the distance $r\delta = R$; in the strongest tension of accommodation for the distance $p\delta = P$. In the former case the rays diverging from r are united on the retina, in the latter those diverging from p. In accommodation the eye must, therefore, be so altered that the rays proceeding from p, in the vitreous humor acquire a direction equal to that of the rays proceeding from r in the non-accommodated eye. This can be effected by placing an auxiliary lens in δ, and we may thus imagine the eye away, and suppose that the auxiliary lens in δ is in the air. The lens now represents the accommodation of the eye, and its power the range of accommodation. Its focal distance, A, is found by the formula mentioned; $\frac{1}{P} - \frac{1}{R} = \frac{1}{A}$. Consequently A is the focal distance of the auxiliary lens, of which the eye avails itself in accommodation, and as the power of a lens is inversely proportional to its focal distance, $\frac{1}{A}$ or 1 : A expresses the range of accommodation. It is convenient to represent the value of A in Parisian inches, especially as the focal distance of lenses is usually stated in the same, and this applies, also, more particularly to spectacles." (Donders, p. 30). To illustrate this let us suppose that in a given case $R = \infty$, P = 5 inches by the formula $\frac{1}{A} = \frac{1}{P} - \frac{1}{R}$ we should obtain $\frac{1}{A} = \frac{1}{5} - \frac{1}{\infty} = \frac{1}{5}$. Hence the range of accommodation would be equal to a convex lens of 5 inch focus.

In cases where the patient is unable to read No. XX at 20 feet, the greatest distance at which he can read No. 1 must be ascertained. If he reads it at 10 inches $R = \frac{1}{10}$, and if he can read it no nearer than 5 inches $P = \frac{1}{5}$. By the same formula we have $\frac{1}{A} = \frac{1}{5} - \frac{1}{10} = \frac{1}{10}$. The power of accommodation in this case is only equal to a convex lens of 10 inch focus.

A convenient method for testing the range of accommodation is to place a strong convex lens before the eye and request the patient to read No. 1, Snellen. If No. 6 convex be placed before a normal eye, whose far point lies at infinite distance, r will be found to lie at 6 inches in front of the lens, (No. 1 Snellen can be read at no greater distance,) for the lens will render rays parallel emanating from a point 6 inches in front of it. The near point will lie at about 2½ inches in front of the lens. This point, how-

ever, varies with the age of the patient. The far point (r') and the near point (p') thus found, bear the same relation to each other as the real points r and p, as their distances are diminished in an equal ratio. The range of accommodation is, therefore, easily found by the formula $\frac{1}{A}=\frac{1}{P}-\frac{1}{R}$. If r' lies at 6 inches and p' at 3 inches, $\frac{1}{A}=\frac{1}{3}-\frac{1}{6}=\frac{1}{6}$.

Besides the absolute range of accommodation described above, which exists when each eye is examined separately, it is necessary to distinguish two other ranges, the binocular and the relative. The binocular range is sufficiently explained by its name. The relative range is the degree of accommodation which exists while the convergence of the visual lines remains in a fixed state.

ANOMALIES OF REFRACTION AND ACCOMMODATION.

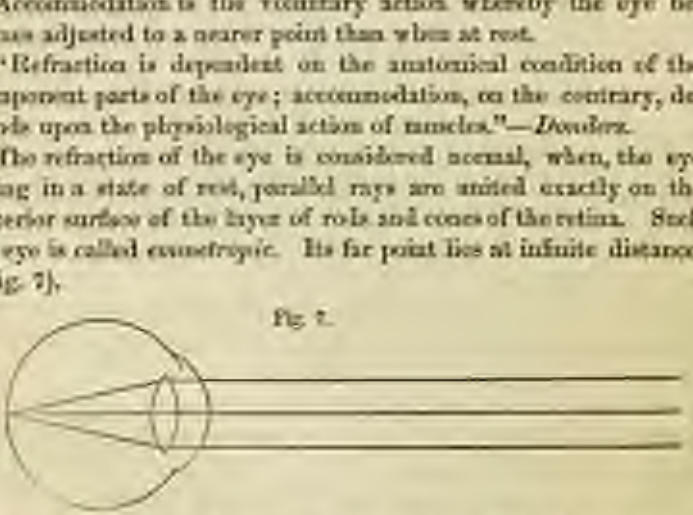
By refraction of the eye is understood its refraction while at rest, independent of muscular action. Its degree is ascertained to a nicety by an examination made while the muscles of accommodation are paralyzed. In a state of rest the eye is adjusted for its farthest point.

Accommodation is the voluntary action whereby the eye becomes adjusted to a nearer point than when at rest.

"Refraction is dependent on the anatomical condition of the component parts of the eye; accommodation, on the contrary, depends upon the physiological action of muscles."—*Donders.*

The refraction of the eye is considered normal, when, the eye being in a state of rest, parallel rays are united exactly on the anterior surface of the layer of rods and cones of the retina. Such an eye is called *emmetropic*. Its far point lies at infinite distance. (Fig. 7).

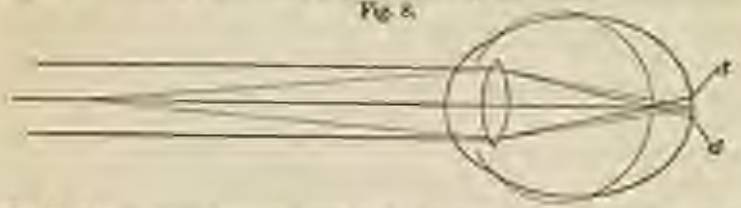
Fig. 7.



The eye may deviate from the emmetropic condition in two ways. Its principal focus may lie in front of the retina, or behind it. In the former case *myopia* exists, and divergent rays only will be

united upon the retina (Fig. 8). Parallel rays are brought to a focus in front of the retina. Circles of diffusion (*d d*) are formed upon the retina, and vision is consequently indistinct.

Fig. 8.



In the latter case *hypermetropia* exists and only convergent rays are brought to a focus upon the retina (Fig. 9). Parallel rays are brought to a focus behind the retina, and circles of diffusion (*d d*) are formed upon the retina.

Fig. 9.

It will be seen from this that myopia and hypermetropia are exactly opposite conditions of the eye.

The refraction may vary in the different meridians of the same eye. It may be emmetropic in the horizontal meridian, and myopic or hypermetropic in the vertical, and *vice versa*, or differences in the degree of the same anomaly may exist. This asymmetry is termed astigmatism.

The anomalies of accommodation are dependent upon the following conditions:—Loss of the lens, weakness, paralysis, or spasm of the ciliary muscles.

Deficiency in the range of accommodation dependent upon either of the before cited causes, if extensive, should, as far as possible, be remedied by glasses.

Presbyopia is the diminution of the power of accommodation dependent on advanced life. In it the near point recedes farther and farther from the eye with increasing years. In pure presbyopia the far point is unaffected. Quite late in life, however, a slight degree of hypermetropia is acquired from the flattening of the lens.

Presbyopia is chiefly dependent upon changes in the structure of the lens, which in old age becomes more firm, resisting in a greater or less degree the action of the ciliary muscle.

The retrocession of the near point commences as early as the tenth year, but is not usually recognized until about the fortieth year. An eye is considered presbyopic as soon as the near point has receded to a greater distance from the eye than 8 inches. Presbyopia may, therefore, co-exist with myopia of less than $\frac{1}{8}$, but it manifests itself later in life. Presbyopia co-exists with hypermetropia in cases where, the hypermetropia having been corrected by means of glasses, the near point lies at a greater distance than 8 inches.

In pure presbyopia the normal acuteness of vision and normal range of accommodation may in all cases be restored by means of proper convex glasses. The range of accommodation in presbyopia is determined by the same method as in emmetropia.

The opinion is very general that the use of convex glasses should be deferred as long as possible. This is a very grave error, and I am forced to believe that pride often contributes largely to the entertainment of this opinion. The overtaxing of the accommodation in the endeavor to see small objects hastens the progress of the affection, and at the same time wearies the patient unnecessarily. There can be no question of the propriety of furnishing patients with suitable glasses as soon as they are in the slightest degree annoyed or inconvenienced by presbyopia. We often see cases where at 50, 60, and occasionally even at 70 years of age, a person is able to read at a distance of 10 or 12 inches without the aid of glasses. Such people always consider themselves lucky exceptions to the general rule, and usually attribute it to their good judgment in the management of their eyes, more particularly in never having indulged in the use of glasses. In point of fact such people owe their immunity from the use of glasses to being slightly myopic, as may be proved by requesting them to read No. XX Snellen at 20 feet. They will not be able to do so except with the assistance of concave glasses of $\frac{1}{8}$ to $\frac{1}{12}$. Myopia may always be diagnosed in cases where spectacles have not been required for distinct vision of near objects at or soon after the fortieth year. Donders, after treating of this subject, says: "The more I investigate the subject, the more fully I am convinced that at a given time of life the range of accommodation is an almost law-determined quantity." I must differ with him so far as to claim that presbyopia

progresses much more rapidly when the eye is overtasked by poor artificial light.

The degree of presbyopia is easily determined after having once decided upon a definite distance (8 inches) as its commencing point. Thus if the presbyopic near point (p_2) lies at 16 inches $P_2 = \frac{1}{8} - \frac{1}{16} = \frac{1}{16}$, and ought, *ceteris paribus*, to be corrected by convex glasses of 16 inch focus. In practice, however, these glasses are found to be somewhat too strong, for, owing to the increased convergence of the optic axes, they will bring the near point closer to the eye than 8 inches. The weakest glasses that will enable the patient to read, easily, No. 1 Snellen at 12 inches are usually sufficient, in cases where no hypermetropia exists, and even these may not be tolerated at first. If the range of accommodation be good p may usually be brought to 8 inches, but if it be much diminished, p must not lie nearer than 10 or 12 inches.

MYOPIA.

In myopia the far point is more or less approximated to the eye. Parallel rays are not united upon the retina but in front of it, consequently each pencil of rays forms a circle of diffusion on the retina (Fig. 8, *d d*), and distant vision is rendered indistinct. Objects situated at a definite finite distance only will be distinctly seen. It was formerly supposed that myopia was dependent upon an increase in the convexity of the cornea. This is now known to be erroneous. Indeed it has been found that, as a rule, the cornea is less convex in myopic than in emmetropic eyes.

The most frequent cause of myopia is an abnormal increase in the length of the eyeball in its antero-posterior axis. It is often attended with posterior staphyloma, which should always be suspected and sought for, by means of the binocular opthalmoscope, in cases where the existing myopia exceeds $\frac{1}{4}$, as its presence is of the greatest moment to the patient. The manner of finding the far point has been already explained. It only remains necessary for me now to briefly explain the method of ascertaining the existence and approximate degree of myopia, in cases where the statements of the patient are not trustworthy. This is accomplished by means of the opthalmoscope. On examining a myopic eye in the erect image, (with the mirror merely) if the observer fixes his attention upon the optic disc or retinal vessels and moves his head in any direction the image will appear to move in the opposite direction. In emmetropia the image remains fixed, and in hypermetropia it moves in the same direction as the observer's head. To obtain an

erect image of a myopic eye it is necessary to place a concave lens behind the mirror and bring it within the focal distance of the observed eye. The lens renders the convergent rays from the myopic eye parallel, and the fundus of the eye is seen as from an infinite distance.

The ophthalmoscope reveals other peculiarities in the myopic eye, but the limits of this dissertation will not allow of their consideration.

Myopia is sometimes confounded with amblyopia (weakness of vision) as persons affected with amblyopia habitually bring small objects near to the eye in order to obtain larger and more clearly defined retinal images. The diagnosis between the two is easy. In amblyopia the patient is unable to distinguish very small objects at any distance. Moreover, vision is not improved by concave glasses as is the case in myopia, but rendered less distinct, as the glasses diminish the size of the retinal images. Myopia is a disease peculiar to civilization. It is most frequent in the higher and literary circles, and rarely met with in sailors or agriculturists. The principal cause of the disease is the excessive use of the eyes for near objects, conjoined with insufficient light, and a stooping posture, which is so commonly assumed by students. The same causes make the disease progressive. In looking at near objects the optic axes are strongly converged. This causes increased pressure upon the eye, through the medium of the recti muscles, which, if long continued, results in congestion of its inner tunics and increased pressure of the ocular fluids. Bulging of the posterior pole, (that part unlike the rest of the eye receiving no support from the muscles) and consequent lengthening of the antero-posterior axis of the eye, is the final result of this pressure. It is also probable that after the eye has been so constantly accommodated for near objects, that the ciliary muscle may become more or less permanently contracted, and that the lens losing a part of its elasticity, remains abnormally convex. Myopia is hereditary to a great extent, and this hereditary principle is accumulative.

The popular belief that myopia diminishes with increasing age, and more surely where the use of glasses is not indulged in, is erroneous. We have already shown that myopia consists in the approximation of r to the eye, and that the effect of age is to diminish the range of accommodation by removing p farther from the eye. As the causes which give rise to myopia are equally favorable to its further development, by removing the principal of

these causes, (the convergence of the optic axes) we necessarily retard the progress of the disease. This end is accomplished by the judicious use of biconcave lenses or negative menisci, which render parallel rays divergent.

In the selection of glasses for myopes, the weakest that will correct the myopia should be chosen. Too strong glasses are often productive of much injury. If r lies at 7 inches $M=\frac{1}{7}$ and should, theoretically, be corrected by glasses of $-\frac{1}{7}$ but, as the convergence of the optic axes prevents the eye from accommodating itself for its far point, the apparent myopia is greater than the real, and concave 7 is too strong. To ascertain the exact power required, give the patient concave 8 and request him to read No. XX at 20 feet. Let us suppose that he can do so, but that the letters appear indistinct. Concave 20 placed before the spectacles renders the object less distinct, while convex 60 placed before the spectacles renders the letters clear and well defined. Convex 30 impairs the vision. From this we know that the glass is yet too strong by $\frac{1}{20}$. To find the proper power we must deduct convex 60 from concave 8, thus: $\frac{1}{8}-\frac{1}{60}=\frac{1}{9\frac{3}{7}}$ nearly; remembering the rule to give the weakest glass that will correct the myopia, he is furnished with concave $9\frac{3}{7}$, and we find that neither positive nor negative glasses placed before it make any improvement.

It is often necessary to furnish patients with glasses for reading at a distance of 18 inches or 2 feet. In cases where the myopia is considerable or the accommodation poor, it is generally best to furnish them with glasses that bring r to that distance, rather than to wholly neutralise the myopia, which would greatly decrease the size of the retinal images. Suppose a patient requires concave 9 for distance, for objects at 18 inches he will require $-\frac{1}{9}+\frac{1}{18}=-\frac{1}{18}$, and for reading at 12 inches he will require $-\frac{1}{9}+\frac{1}{12}=-\frac{1}{36}$. When the myopia is slight, the range of accommodation good, and the eye otherwise healthy, neutralizing glasses may be worn both for distant and near objects. Donders thinks this is even desirable and that it greatly retards the progress of the disease, particularly in youth. He says: "When persons with moderate degrees of myopia have in youth accustomed themselves to the use of neutralizing spectacles, the eyes are in all respects similar to emmetropic eyes, and the myopia is, under such circumstances, remarkably little progressive. I am acquainted with numerous examples of this, even among those of my friends who have passed their lives in study.

Glasses of $-\frac{1}{6}$ adopted at seventeen years of age, are often still sufficient at forty-five years, both for seeing acutely at a distance and for ordinary close work. Not until the age at which emmetropes need convex spectacles, and often even some years later, do the neutralizing spectacles become rather too strong for close work, and it is desirable to procure somewhat weaker ones, which, with the narrower pupil peculiar to that time of life, are now nearly sufficient for distance also. In order to obtain all the advantages of concave glasses the myope must begin early with them. If the myopia amounts only to a fourth or a third of the range of accommodation, we may immediately wholly neutralize it. If it amounts to more we must usually begin with weaker glasses, and replace them at the end of six months with stronger ones."*

To test the range of accommodation in a myope, glasses should be given him which exactly neutralize the myopia (No. XX being distinguished at 20 feet), with these r will lie at ∞. Then ascertain how near he can read No. 1 with ease. Let us suppose that he reads No. 1 at 3 inches by the formula $\frac{1}{f}=\frac{1}{p}-\frac{1}{q}$ we obtain $\frac{1}{f}=\frac{1}{3}-\frac{1}{\infty}=\frac{1}{3}$. It is important in myopia that each eye be examined separately as well as the two together, for there occasionally exists a marked difference in the degree of myopia in the two eyes, which may demand glasses of different foci. In such cases, if the difference be considerable, it is not usually advisable to furnish each eye with the glass that exactly neutralizes its myopia, for as a rule such spectacles render vision confused, on account of the difference in the size of the two retinal images. In a few cases the patient, after a little practice, is enabled to see clearly with them, and then their use is admissable and even advantageous, as it enables him to estimate distances.† If the patient be annoyed by the difference in the size of the two images, each eye must be furnished with the glass appropriate for the least myopic eye; or the difference of refraction in the two may be partially neutralized by furnishing the least affected eye with its appropriate glass, and the other with one of a somewhat higher power. Thus if the myopia of one eye equals $\frac{1}{12}$ and the other $\frac{1}{8}$ the glasses may be respectively $-\frac{1}{12}$ and $-\frac{1}{8}$ or $-\frac{1}{9}$. The circles of diffusion are thereby diminished, and a certain degree of binocular vision secured. It has been proposed, in

* Donders p. 421.

† It is a singular fact, that when seen by one eye only, a die from which medals are struck, appears in relief like the perfected medal.

such cases, when the sight of the two eyes is equally good, to furnish each eye with the glass which lies midway between the two degrees of myopia. Thus, myopia of one eye being $\frac{1}{2}$ and of the other $\frac{1}{4}$, it would be advised to prescribe $-\frac{1}{3}$ for both eyes, but such spectacles would evidently be of no use to either eye.

HYPERMETROPIA.

Hypermetropia is the exact opposite of myopia. In it the refractive power of the eye is too low, or the optic axis too short, therefore, when the eye is in a state of rest parallel rays are united behind the retina and circles of diffusion are formed upon the retina (Fig. 9, *d*, *d*.) In slight cases of hypermetropia, where the eye is otherwise healthy, the defect is overcome by the power of accommodation. In high degrees, or if the accommodation be poor, the patient will not be able to see clearly at any distance. We must, therefore, furnish him with convex glasses of sufficient power to bring parallel rays to a focus upon the retina. Even stronger ones may be required for near objects when the range of accommodation is short.

Several forms of hypermetropia are recognized. They are divided first into two primitive classes, the original and the acquired. The latter is, in nearly all cases, due to senile changes in the lens, which in old age possesses less refractive power than in youth. Absence of the lens will, of course, give rise to excessive hypermetropia. Original hypermetropia is subdivided into manifest (Hm.) and latent (Hl.) To determine the presence of hypermetropia ascertain if the patient can read No. XX at 20 feet, if he can do so with ease, try whether he can do the same with convex glasses. If he can, he has hypermetropia, and the number of the strongest glass with which he can see distinctly, will indicate the degree of manifest hypermetropia. The degree of real hypermetropia is usually much greater than that of the manifest, for the patient is unable at once to wholly relax the accommodation, even for distant objects, after it has been so long exerted. To determine the real degree of hypermetropia it is necessary to paralyze the accommodation and re-examine. The second examination develops the latent hypermetropia. In hypermetropia, as in myopia, each eye should be examined separately. In young people with good accommodation, slight degrees of hypermetropia often remain unnoticed until the age of 20 or 25, when symptoms of asthenopia arouse our suspicions of its existence. Hypermetropia is termed facultative when the patient is able to see well (with parallel optic

axes) at a distance both with and without convex glasses. Persons affected with it can generally read small print without glasses while young, but presbyopia sets in early, and symptoms of asthenopia soon manifest themselves. Hypermetropia is termed relative when the patient can see well at a distance and near at hand without convex glasses, only by converging the optic axes for a nearer point than that at which the object is situated, thereby producing a periodic convergent squint. In such cases vision is always poor. Hypermetropia is termed absolute when vision is indistinct for all distances even with the strongest effort of accommodation and greatest convergence of the optic axes. It is seldom met with except in advanced life. To find the range of accommodation in a hypermetropic eye, first change it into a normal one by furnishing it with a glass that will bring parallel rays to a focus upon the retina with almost no effort of accommodation, and then find the nearest point at which No. 1 can be distinctly seen. It is usual, in testing the near point, to employ a glass, the index power of which lies between those required for distance before and after the instillation of atropia. Thus, if before the instillation of atropia the patient requires convex 20 for distance, and 10 after it, convex 16 would be the proper glass with which to try the near point. No. 10, which neutralizes the real hypermetropia, would be too strong, for the patient, so long accustomed to strain his accommodation, would be unable, at once, to command the far point with so high a power. An eye with $Hm=\frac{1}{20}$ can see distinctly at a distance with +16 without much effort. Therefore r will lie at ∞. Now suppose p be found to lie at 7 inches, by the formula $\frac{1}{f}=\frac{1}{p}-\frac{1}{r}$ we obtain $\frac{1}{f}=\frac{1}{7}-\frac{1}{\infty}=\frac{1}{7}$. The result obtained by this method is not mathematically exact, but sufficiently so for all practical purposes.

As has been already stated, hypermetropia is the most frequent cause of asthenopia. Asthenopia in hypermetropes is due to the over-straining of the accommodative apparatus in the attempt to unite parallel and divergent rays upon the retina. It can be cured only by neutralizing the hypermetropia.

Convergent strabismus is often dependent upon the existence of hypermetropia, and, in such cases, when corrected by an operation, it will surely return if the hypermetropia be disregarded.

In what cases and to what extent is it best to neutralize hypermetropia? This is a question of the greatest importance. In facultative hypermetropia glasses should never be prescribed for distance, for the patient, by a slight effort of accommodation, sees

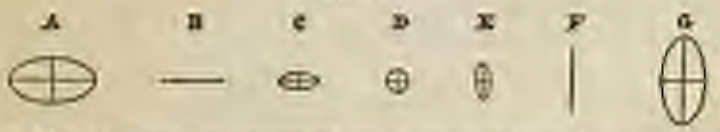
well without them, and by their constant use he would soon lose that power. In cases where asthenopia exists glasses must be given for reading, sewing, &c., that are somewhat stronger than those which correct the manifest hypermetropia. If they are too strong at first, weaker ones must be employed and the strength gradually increased until the asthenopia disappears. In relative and absolute hypermetropia spectacles should be worn both for distant and near objects, for in such cases all vision is indistinct. It is generally best to commence with glasses which neutralize the manifest hypermetropia. It is sometimes necessary to give weaker glasses at first for distance, and gradually increase their strength. In cases where there is co-existent presbyopia, stronger glasses must be prescribed for near objects.

ASTIGMATISM.

Astigmatism consists of a difference in the degree of refraction in the different meridians of the same eye. Nearly all eyes are, strictly speaking, slightly astigmatic, for the focal distance of the normal eye is generally shorter in the vertical than in the horizontal meridian. This explains why a ray of light, passing through a minute round opening in a dark screen, appears as a round point only when seen from a certain distance. When carried farther off it is elongated in a vertical direction, and when brought nearer to the eye, in a horizontal direction. Figures 10 and 11 will serve to elucidate this fact.

Fig. 10.

Fig. 11.



Let Fig. 10 represent an eye whose shortest radius of curvature is in the vertical meridian and the longest in the horizontal. The anterior focal point of the eye in the vertical meridian is situated at B, and in the horizontal meridian at F. The space between

these two points is called the focal interval. Vertical rays emanating from a luminous point situated at B will be united on the retina, but as the focal point of the eye for horizontal rays lies at F, such rays emanating from a point of light situated at B will not be brought to a focus on the retina but behind it, consequently the retinal image will have the form of a horizontal line (Fig. 11 B.) In the same manner a point of light situated at F, will appear as a vertical line (Fig. 11 F.) The vertical meridian of the retinal image increases and the horizontal decreases in direct ratio as the object is carried from B to F, and vice versa. The forms which the retinal image of a point of light assumes, when situated at different points within the focal interval, are seen in Fig. 11. The letters correspond to those of Fig. 10. From the foregoing it will be seen that fine vertical lines can be seen at a greater distance from the eye than horizontal lines, while the latter can be seen closer than the former. At B horizontal lines will appear perfectly distinct, for at that distance aberration exists only in the horizontal meridian. The diffusion images, therefore, will have the form of short horizontal lines, the overlapping of which can cause no confusion of the object, as it is itself a horizontal line. For the same reason vertical lines are seen distinctly at F. General vision is most distinct when the object is situated at D, for at that point only small circles of diffusion are formed upon the retina. The point D is the mathematical near point of the eye, to which reference has already been made. Although the maximum of curvature generally corresponds to the vertical meridian and the minimum of curvature to the horizontal meridian, this does not always obtain. The maximum and minimum of curvature may correspond to any two opposite meridians. When the aberration is due to a difference in the refractive power of the two principal meridians, it is termed regular astigmatism; when due to a difference in the refraction of different parts of the same meridian, it is called irregular astigmatism. The former depends upon irregular curvature of the cornea, and is to be remedied by cylindrical glasses in the manner to be hereinafter explained. The latter depends, generally, upon a peculiarity in the structure of the lens, and cannot in such cases be corrected, except by the removal of the lens, when the case is converted into one of simple absolute hypermetropia.

The slight degree of regular astigmatism, which exists in the normal eye, does not materially impair the vision. An eye is con-

sidered to be astigmatic, only when the degree of aberration is sufficiently great to render vision indistinct by the overlapping of the circles of diffusion. Such an eye can see neither near or distant objects clearly, nor is vision much improved by spherical lenses in cases where myopia or hypermetropia co-exists with the astigmatism.

The diagnosis of astigmatism is generally easy, and to be made as follows: First, examine carefully the acuteness of vision by ascertaining which number of Snellen's test-types the patient can read at 20 feet. If he cannot read No. XX try the effect of convex and concave spherical lenses; if he is still unable to decipher it the presence of astigmatism must be suspected. The situation of the two principal meridians of the eye (i. e. the maximum and minimum of curvature) may be found by directing the patient to look at a small distant point of light. If the eye is astigmatic this point will not appear round but elongated in a certain direction, accordingly as the object is nearer or farther off than the point for which the eye is accommodated. In conducting this examination, it is customary to place, at a distance of 12 to 16 feet in front of the patient, a large dark screen with a round opening, varying from 2 to 4 millimètres in diameter, for the transmission of light. By moving the screen backwards and forwards in front of the patient the principal meridians are readily found. Their position is, however, more accurately and easily determined by means of Green's test objects, three of which are represented in Figures 12, 13 and 14.

Fig. 12.

The first consists of a circle traversed by a set of twelve triple radiating lines, with figures at their distal extremities, corresponding to those on the dial of a watch. Each primitive line is equal in width to those employed in the construction of No. XX of Snellen's test-types. The inner circle is 9 inches in diameter. The

other objects are simply modifications of the first. For a full description of them and their use see the Transactions of the American Ophthalmological Society for the year 1868. All the lines should be distinctly seen at a distance of 20 feet. If they

Fig. 13.

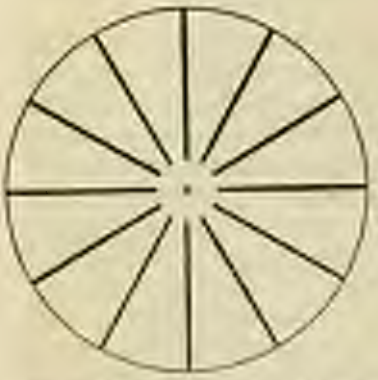


Fig. 14.

are, with or without the aid of spherical glasses, the patient is not astigmatic, but if, on the other hand, the lines in one meridian only are sharply defined, astigmatism exists, and the direction of the distinct lines corresponds to one of the principal meridians of the eye. To ascertain the nature and degree of astigmatism, it is only necessary to find the weakest concave or strongest convex lens which will enable the patient to see all the lines with equal distinctness. If a concave lens is required it is a case of myopic astigmatism; if a convex, of hypermetropic astigmatism. The power of the lens will, in each case, indicate the degree of apparent astigmatism. In some cases of hypermetropic astigmatism a portion of the aberration is concealed by the effort of accommodation. It is, therefore, necessary to paralyze the accommodation in order to determine its real degree. Dobrowski, of St. Petersburg, claims that regular astigmatism may be assimilated or temporarily overcome by irregular spasmodic action of the ciliary muscle, the convexity of the lens being unduly increased in some one meridian. Several other methods have been devised for the determination of this anomaly, but those already explained are sufficient for our purpose.

Regular astigmatism is either simple, compound, or mixed. In the simple form the eye in one principal meridian is emmetropic, and in the other myopic or hypermetropic. If such a case be examined with the stenopeic apparatus, and the slit turned in the di-

rection of the normal meridian, vision will be perfect, but if the slit be turned in the direction of the astigmatic meridian, a convex or concave spherical lens will be required. Simple astigmatism is sub-divided into simple myopic astigmatism (Am) and simple hypermetropic astigmatism (Ah).

In compound astigmatism myopia or hypermetropia exists in both principal meridians, but in different degrees. Here we must also distinguish two forms. 1. Compound myopic astigmatism (MAm) in which myopic astigmatism is superadded to myopia, and, 2. Compound hypermetropic astigmatism (HAh) in which hypermetropic astigmatism is superadded to hypermetropia.

For example, let us suppose that in the vertical meridian $M=\frac{1}{10}$ and in the horizontal $\frac{1}{5}$. There would then exist $M\frac{1}{10}$ common to all the meridians and in addition, in the vertical meridian, $Am=\frac{1}{10}-\frac{1}{5}=\frac{1}{10}$. The condition of the eye is expressed thus; $M\frac{1}{10}+Am\frac{1}{10}$. Mixed astigmatism is very rare. In it one principal meridian is myopic and the other hypermetropic. It exists in two forms. 1. With predominant myopia (Amh). 2. With predominant hypermetropia (Ahm). Astigmatism may be congenital or acquired. In the majority of cases it is congenital, and often hereditary. Congenital astigmatism is usually regular and exists in both eyes, although, perhaps, in different degrees. It is most frequent in hypermetropia. Acquired astigmatism is nearly always dependent upon morbid changes in the curvature of the cornea; the result of inflammatory process or the irregular union of the incision after cataract and similar operations. It can be very imperfectly, if at all, corrected.

As has already been stated, cylindrical lenses possess the power of refraction in but one of the principal meridians. It follows from this that regular astigmatism may be corrected by means of cylindrical glasses. The axis of a convex cylindrical lens, employed in the treatment of astigmatism, must correspond exactly to the highest refracting meridian of the eye, and that of a concave, to the lowest refracting meridian. The slightest deviation from the above rule will render vision confused. Nachet's trial spectacle frames are very convenient in the adapting of cylindrical glasses. They are round, to permit the rotation of the glasses. The upper half of each circle is divided into degrees numbered from 0 to 180°. The meridian of greatest curvature is marked in each glass. The angle of inclination of the principal meridian can, therefore, be read off from the frames, after the proper adjustment of the

lens. Three kinds of lenses are required for the correction of the different forms of astigmatism, viz: Plano-cylindrical, bi-cylindrical, and spherico-cylindrical. I will now illustrate, by a few examples, the manner of selecting cylindrical glasses for the correction of astigmatism. Let us suppose a case in which E exists in one principal meridian (R$=\infty$) and in the other M$=\frac{1}{3}$ (R$=\frac{3}{1}$), consequently we have Am$=\frac{1}{3}-\frac{1}{\infty}=\frac{1}{3}$. The aberration is corrected by a concave cylindrical glass of 9 inch focus* (written $-\frac{1}{9}c$). Simple hypermetropic astigmatism (Ah) $=\frac{1}{3}$ is corrected by $+\frac{1}{10\frac{1}{2}}c$. Compound myopic astigmatism (MAm) is corrected by concave spherico-cylindrical glasses, thus: MAm composed of $M\frac{1}{3}+Am\frac{1}{3}$ is corrected by $-\frac{1}{3}c$† combined with $-\frac{1}{3}c$,† (written $-\frac{1}{3}c\sqsubset-\frac{1}{3}c$). Compound hypermetropic astigmatism (HAh) requires convex spherico-cylindrical glasses, thus: HAh composed of $H\frac{1}{3}+Ah\frac{1}{3}$ is corrected by $\frac{1}{3}c\sqsupset\frac{1}{3}c$. Mixed astigmatism (Amh and Ahm) requires bi-cylindrical glasses, having one convex and one concave surface, the axes of the two forming a right angle thus: Amh composed of $M\frac{1}{3}c+H\frac{1}{9}$, is corrected by $+\frac{1}{9}c$ and $-\frac{1}{3}c$ with their axes at right angles, (written $\frac{1}{9}c\sqcap-\frac{1}{3}c$.) And Ahm composed of $H\frac{1}{3}+M\frac{1}{9}$ by $\frac{1}{3}c\sqcap-\frac{1}{9}c$. The foregoing examples explain the method of correcting, at once, both the astigmatism and anætropia. In other words, of converting the eye into an emmetropic one. This is not always desirable, for whilst the correction of astigmatism always improves vision, the use of very strong glasses interferes with the combined action of the ciliary and internal recti muscles in the effort of accommodation as well as greatly to affect the size of the retinal images. If it be desired to correct the astigmatism and retain a definite degree of myopia it is simply necessary to deduct the desired degree of myopia from the refractive power of the two principal meridians, and then correct the remaining anætropia. Examples: E exists in the principal A meridian, and M$=\frac{1}{3}$ in the v. We wish to obtain $M\frac{1}{6}$. De-

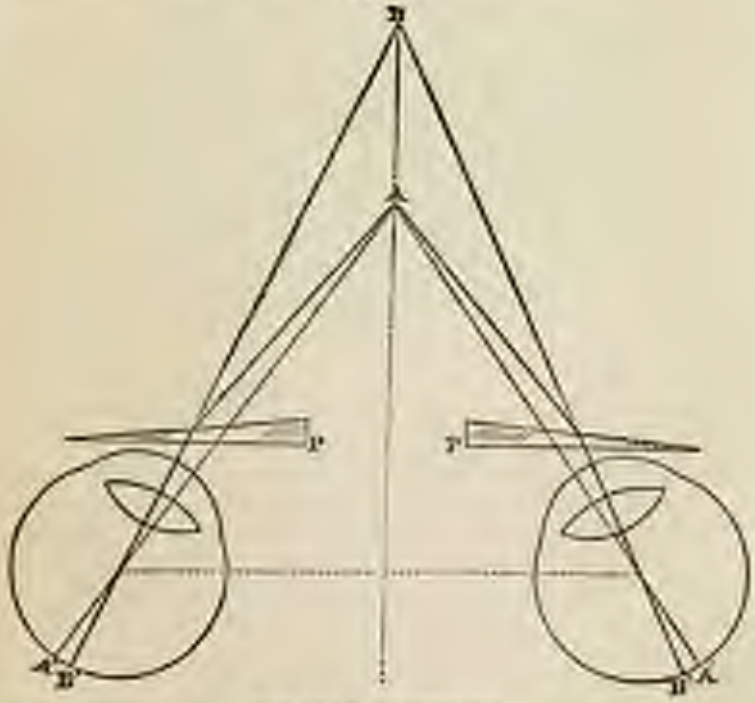
* As the lens is placed about $\frac{1}{2}$ inch in front of the nodal point of the eye, it is necessary, except where the degree of aberration is very slight, to deduct $\frac{1}{2}$ inch from the focal distance of concave lenses, and add $\frac{1}{2}$ inch to that of convex lenses.

† For the sake of simplicity the correction proceeding from the distance between the lens and the nodal point of the eye will be omitted in the examples of compound and mixed astigmatism.

ducting $M\frac{1}{8}$ from the refraction of each meridian, we have in A, E—$M\frac{1}{8}=H\frac{1}{8}$, and in c, $M\frac{1}{4}-M\frac{1}{8}=M\frac{1}{8}$. This is corrected by $\frac{1}{8}c\,\Gamma-\frac{1}{8}c$. In A, $M=\frac{1}{8}$, in c, $M=\frac{1}{4}$. We desire $M\frac{1}{2}$. Deducting $M\frac{1}{8}$ we obtain in A, $M\frac{1}{4}-M\frac{1}{8}=E$, in c, $M\frac{1}{2}-M\frac{1}{8}=M\frac{3}{8}$; corrected by $-\frac{1}{8}c$. In A, $H=\frac{1}{4}$, in c, $H=\frac{1}{2}$; we desire $M\frac{1}{16}$, deducting $M\frac{1}{32}$, we obtain in A, $H\frac{1}{8}-M\frac{1}{16}=H\frac{1}{4\frac{1}{2}}$, in c, $H\frac{1}{4}-M\frac{1}{16}=H\frac{1}{8}$ corrected by $\frac{1}{8}c\frac{1}{8}c$. In c, $M=\frac{1}{16}$ in A, $H=\frac{1}{8}$, we desire $M=\frac{1}{32}$, by deduction we obtain in c, $M\frac{1}{32}-M\frac{1}{64}=M\frac{1}{64}$, in A, $H\frac{1}{64}-M\frac{1}{32}=H\frac{1}{64}$ which is corrected by $\frac{1}{64}c\,\Gamma-\frac{1}{64}c$.

Irregular astigmatism cannot be corrected by cylindrical glasses but may be partially remedied by stenopaic spectacles which exclude a portion of the irregularly refracted rays.

Fig. 15.



MUSCULAR ASTHENOPIA.

Muscular asthenopia is dependent upon insufficiency of the internal recti muscles. The patient is unable to maintain, for any length of time, sufficient convergence of the visual lines to obtain binocu-

ter vision of near objects. One eye soon falls off, and vision becomes indistinct by reason of the overlapping of the retinal images of two distinct objects. In reading, the letters run into each other. In slight cases this may be remedied by the use of prisms, placed in front of the eye as represented in Fig. 15.

The properties of prisms are to refract rays towards their bases. Therefore rays emanating from A, (Fig. 15) instead of continuing on in a straight line to A', will be deflected to B'. The object will appear to be situated at B, and the visual line will correspond to the line B B'. In severe cases the action of prisms is insufficient and tenotomy of the external recti must be performed. The decentred glasses of Giraud Teulon act as prisms and are very serviceable in cases of hypermetropia and myopia complicated with slight insufficiency of the recti muscles. Prisms with one convex or concave surface are preferable in extreme cases of insufficiency complicated with slight ametropia.

In conclusion it only remains for me to give a few general instructions for the selection of spectacles. It is necessary, except where prisms are indicated, that the optical centre of the glass should be exactly in front of the pupil. It is also important that the plane of the glasses should form as nearly as possible right angles with the visual lines, because under this condition there is the least aberration. Thus a different form of frame will be required for reading and writing than for out of door use.

Concave glasses should be placed as near to the eye as possible, for the farther they are removed from it, the more they diminish the size of the retinal images.

The use of single eye-glasses, so fashionable at the present day, should not be permitted, for two reasons. The unassisted eye becomes impaired from disuse. The retinal images differing in size, as well as acuteness, it is necessary that one be disregarded. The effort required to accomplish this is in itself a fruitful source of permanent injury.

The best lenses are the French which are cast from the best of glass and then accurately ground and polished. Pebbles, which have been so highly extolled, are inferior to the French glasses in every particular except for durability. On account of their hardness they are not easily scratched. A pebble, to be a perfect lens, must be so cut from the crystal that its axis shall correspond exactly to the primary axis of crystallization. If it be not so constructed, it will give rise to a slight degree of acquired astigma-

tion, which must be overcome by an effort of the accommodation. Were we to examine, by polarized light, a thousand pebbles manufactured for the general market, we should hardly find a perfect one.

As scientific, and I may add conscientious opticians are rare, I will state, as the result of my own experience, for the benefit of my professional brethren, that they can place full confidence in the house of Thaxter & Bro., 139 Washington Street, Boston, who are prepared to promptly furnish all kinds of glasses which any of them may be called upon to prescribe.

In treating a subject of so much importance within the prescribed limits of a dissertation, I have been compelled to omit much that I should otherwise have included. It has, however, been my aim to present such parts of the subject as, in my judgment, are the most important, in as concise and clear a manner as possible. I have avoided abstruse mathematical calculation, and have introduced only such formulæ as I have considered absolutely necessary. My task has been a difficult one, and I cannot flatter myself that I have accomplished it in the manner that I could wish.

ERRATA.

Page 228, line 16, for opthalmometre *read* ophthalmometer.

" 235, line 8, for P, *read* presbyopia.

" " lines 29 and 36, also page 236, line 6, for opthalmoscope *read* ophthalmoscope.

Page 240, line 35, for convergent *read* convergent.

ARTICLE XIII.

HYDROPHOBIA.

Read before the New Haven County Society, October, 1868.

BY P. L. ICKELIS, M.D., OF NEW HAVEN.

Just at the close of day on the 23d of May, 1868, a large Newfoundland dog entered the yard of Mr. Timothy Fowler, No. 185 Whalley avenue, killed two kittens, and, when assailed by their mother, bit her, and then attacked a small terrier, inflicting a severely lacerated wound on his back.

Passing from thence to the yard of Mr. Alfred Todd, No. 285 Whalley avenue, he halted for a moment and stared in at the basement window. Francis H. Todd, a young man of 20 years, looking out, in the twilight mistook the animal for a neighbor's dog, and, as a rope was dangling at his neck, supposed he had escaped from his owner.

The dog walked out of the gate, crossed to the south side of the street and took his way up the avenue; young Todd following on the north side of the road and hastening to overtake and secure him.

When nearly opposite the animal, he called out, "Dan," and whistled, still believing it was the neighbor's dog. The latter turned his head and trotted deliberately towards the young man, who reached forth to pat his head, when he snapped his teeth twice over his right hand, deeply wounding the tissues at the junction of the metacarpal and phalangeal bones of the middle and ring fingers, and biting sharply the end of the middle finger.

The brute immediately recrossed the street, and slowly trotted away, keeping his course up the avenue, and was never seen afterwards. The bitten man returned to his house,—the hand dripping with blood—when his friends hurried him to the office of Dr. Tyler who considered the injury a grave one and decided to treat it as such, although there was no certainty that the dog was mad.

It was not possible to excise any portion of the wounded parts without doing irreparable damage to the hand, neither was it easy to cauterize deeply the wounds. He therefore prepared a tepid solution of aqua ammonia, as strong as could be borne, and had the bitten part immersed in it for about 15 minutes; he repeated this process and then applied a blister over the dorsal and palmar surfaces of the hand and over the end of the injured finger, advising that these should be kept discharging for a number of days. This counsel was followed and at the end of two weeks the wounds were allowed to heal,—the resulting cicatrices presenting a normal appearance,—and the patient went about his ordinary business. It is not known by his friends that he felt any uneasiness in the wounded limb, until Saturday night, June 13—a period of 22 days subsequent to the reception of the injury—when he complained of some pain in the hand and arm, without his attention being particularly directed to the cicatrix. He was also more tired than usual and his spirits were drooping.

This pain and languor continued during the following day but did not prevent his attendance at church.

By Sunday evening it had increased so much that he was persuaded to visit Dr. Tyler, who prescribed a liniment of aqua ammonia and chloroform. After his call on the doctor, entirely unknown to the latter, he drove with his wife to Ansonia and returned about 10 P. M.

He passed an unquiet night and remained in bed until noon the next day, when he appeared at the table and ate a moderate dinner, but repaired without delay to his bed. He refused to come to the tea-table, but about 6 P. M. asked for some milk, which he drank, and then he called for water. Attempting to swallow this, a spasm of the facial muscles occurred; he declared he could not take it, and begged them to go for a doctor.

Dr. Tyler was disabled at the time and the messenger came for me. At 8 P. M. I found the patient lying quietly in bed, his pulse 84, skin cool, tongue moist and clean, his mind undisturbed and a natural expression of countenance except the pupils of the eyes, which were dilated. He said there was slight pain in the arm and shoulder of the bitten limb, and a little headache, otherwise he was comfortable. When asked if he was thirsty, he replied no, but would like a little water.

He received it from a spoon, and as the fluid touched his lips, a spasm of the facial, fascial, and thoracic muscles followed.

About 9 P. M. a teaspoonful of chloric æther and aromatic spirits of ammonia was given him, when the same phenomena occurred as when he took the water, and soon after he complained of pain in the stomach and nausea. At 10 o'clock one-fourth gr. of sulph. morph. was given, which allayed all pain in the area and stomach and he said no more about the nausea, but was sleepless and restless.

About 1 A. M. the morphine was repeated but it did not relieve his disquietude. He was continually changing his position in the bed, his respiration was sighing and there was an occasional gasping for breath. About 2 A. M. he called for water, and tried to drink it from the cup, but as the vessel came in contact with his mouth, he shuddered, a severe spasm followed, and he thrust it quickly away, saying with a good deal of emotion, "I can't take it." Dr. Pierpont called about this time, and while he was present the patient desired some milk, which he took with much less difficulty than he did the water, though only as it was fed to him with a spoon.

His restlessness continuing, the ammonia and chloric ether were given again, when a more severe spasm resulted than any we had previously seen; it went the wrong way, he said, and he rejected the greater portion of what was prepared for him.

After this trial he groaned a good deal, said he was in no pain, but a strange feeling oppressed him.

A little before 4 A. M. he fell asleep and remained so for three-quarters of an hour, when he awoke and called for water, which excited the same spasmodic actions as before.

He was hungry and asked for toast or crackers, something which had no liquid. He sat on the edge of the bed and tried to pass urine but was unable from sheer debility, and he fell back on his pillow somewhat exhausted by the effort of getting up.

About this time he made a painful exertion to clear his throat of tough mucus and succeeded with temporary relief. He took his toast at 6 A. M., swallowing with facility, and soon after managed to evacuate his bladder by using a bed-pan. About 7 A. M. Drs. Tyler and Bulkley arrived. The treatment during the night had been directed simply to tranquilize the patient and subdue pain. I had resolved from the first—as far as I acted independently in this case—to use no violent means, such as the actual cautery, hot bath, bleeding to syncope; neither to administer those powerful drugs, in doses that the experience of all time had proved

were of no avail, but which had augmented actually—many of them at least—the distress of hydrophobic patients; but to use diffusible stimulants and morphine in moderate quantities and resort to the inhalation of chloroform should the patient become uncontrollable. It was, therefore, with a sensation of relief that I listened and assented to Dr. Tyler's plan of treatment which was briefly this: to eliminate the poison by inducing profuse diaphoresis, through the agency of the skins of recently killed sheep, in which the patient was to be enveloped; to calm the nervous symptoms with free doses of Cannabis Indica and morphine, and to sustain the strength with nutrients and stimulants. Dr. Bulkley concurred in this mode, and it was commenced at once, Dr. B. remaining with the patient until noon. Soon after the application of the sheep-skins an abundant perspiration poured forth from all parts of the body and he seemed to lie a little more quietly than he had lain during the night, unless the perspiration trickled down his face, or fluids were given him, either of which would cause severe spasms of the facial and thoracic muscles. It was about this time that he first complained of pain over the ensiform cartilage, and this distress was not absent during the remainder of his illness. About 11 A. M. it was greatly increased and severe spasms followed in quick succession. Chloroform by inhalation was now given and though its vapor excited violent convulsive efforts, these were soon overcome and he sank into a deep unconsciousness, from which he speedily awoke and for half an hour was almost entirely free from pain, although slight spasms would occur at short intervals. They soon returned with aggravated force and chloroform was again given, and its administration was followed by the same delightful relief. One thing was noticeable, the chloroform contracted the pupils. Between 12 and 1 P.M. Dr. Tyler revisited the house and soon after Dr. L. Ives called; the latter suggested a trial of the Calabar bean, in connection with the eliminative treatment, which was consented to by Dr. Tyler and myself, the more readily perhaps, because we were forced to admit that notwithstanding the occasional intervals of repose, the disease was steadily making progress.

It was known that Dr. Townsend possessed a quantity of this medicine and was somewhat familiar with its use, and he was requested to visit the patient and superintend its administration. About 1 P. M. the patient commenced to be delirious and an attempt was made to repeat the chloroform inhalation, but it caused so much distress, and he implored so earnestly to have it taken

away, that it was not persisted in. Soon after this a fearful paroxysm took place; tossing the bed clothes from him he threw himself crosswise the bed, flat on his face and lay in this position for some moments, with his hands outstretched on the floor, his neck elongated, his eye glaring wildly, all the time coughing out saliva and leering at those around him. He exclaimed that for the moment he was free from the unutterable anguish which had possessed him, and begged us not to disturb him, that for the whole world he would not be moved for he was easy now. He apologized for his boisterous conduct; it was his nerves, he said, which he could not control. He was seen in this situation at 2 P. M. by Dr. Townsend; the sight of the latter infuriated him, and from this time until he died, the view of a new face, particularly if the person hesitated on the threshold of the door and looked in at him, excited fearful spasms. The story of the Calabar bean, in connection with this case, can be told in few words; five drops of the saturated tincture (a tested preparation) were given at 2 P. M., ten drops at 3, fifteen at 4, fifteen at 5, a half teaspoonful at 6, at half past 6 a half teaspoonful, and at 7 a half teaspoonful, which last was partly lost in the attempt to administer it. This medicine had, apparently, no other effect than would have followed the exhibition of a similar quantity of water. As the day advanced another phase of the disorder appeared, to the beholder the most painful of all, and one which steadily increased until he died. It was a terrible apprehension of some impending calamity. Now it was that some fiendish men were seeking to annihilate him, and again, that he was to suffer some dreadful penalty for crimes which he had never committed. He would bury himself beneath the bed clothes and howl with fear, calling to those around to protect him from the horrible danger, then as if every energy of his mind and body was aroused to combat his enemies, he would spring with a scream like a maddened animal and proclaim himself no longer afraid but prepared to grapple with his foes and destroy them, or be himself destroyed. About 4 P. M. two of his friends called and gazed in at the door, my finger was on his pulse at the time, it was then beating about 80 per minute, I felt it rapidly running up to 112 and before time was given for one to collect his thoughts, he uttered a yell and darting like an arrow towards a window which looked on the street, thrust his arms through the glass, fortunately without wounding himself. He eluded the grasp of his attendants so dextrously that only the closed blind pre-

vented his complete escape. After he was placed in bed he began to make excuses for his behavior; it was his nerves which he could not control; no one knew, he said, the agony he was suffering. A little later Drs. Bulkley and Townsend called, we were conversing apart in a low tone when he suddenly sprang from his bed with a scream and but for his attendants would have assaulted us; we were whispering about him, he said, and that he could not and would not endure. When this paroxysm had abated he was completely exhausted, and he then proceeded to excuse himself again for his conduct, but appealed to us if this time he had not sufficient provocation. Each exacerbation was more violent than the one which preceded it, so that about 6 P. M. it became necessary to confine him in a straight waistcoat, and for the next six hours he made the most mournful petitions and violent struggles for release, all the time ejecting the saliva in every direction. From this hour until he died the prominent mental symptom was profound and inexpressible despair.

About 8 P. M. Drs. Ives and Townsend called, and it was thought best to give him ten-spoonful doses of Tinct. Calabar Bean, but by this time he had conceived such intense disgust of the medicine, that it was impossible to administer it, and nothing more was given by the stomach.

He would call at the top of his voice on his father, mother and wife, to come and deliver him from the awful fate which awaited him; he was no worse than others, he said, and he was shocked at the injustice which doomed him to expiate the crimes of those as bad or worse than himself. He should die before morning, he cried, unless succor came, and he adjured them in the most piteous and solemn manner, to fly to the rescue of their poor innocent boy, and save him from the awful ruin which encompassed him.

Language is inadequate to describe the afflictions of this poor man, and if it were, the tale would weary the ear. The succeeding hours until midnight were but a repetition of fearful struggles for freedom from restraint and monstrous fancies crowding his affrighted mind. Early in the disease he had imagined that he was more comfortable if I were at his bedside, and during the day had implored me not to leave him; if I absented myself for a short period only in an adjoining room, he would send messengers to hasten me to him. Even in his most turbulent moments he had listened to me. But the little consultation with Drs. Bulkley and Townsend had stirred up suspicions which no explanations could ap-

peace. He soon commenced to denounce me as his bitter enemy, and for the last six hours of his life, never looked in my face, or heard my name spoken without giving forth a scream of terror. He accused me of putting some of that hateful medicine (meaning the Calabar Bean) in his eye, and that he said had given him more distress than anything beside.

He was a young man of remarkable intelligence and amiability, and these qualities had found expression in an agreeable and ingenuous countenance, which had maintained its composure—except when it was convulsed—up to the commencement of the delirium.

So late as 12 o'clock noon, he had chatted familiarly with those around him. But a few hours had wrought painful changes in his visage, his features had now become ghastly and shrunken, and his eyes seemed as if they would leave their sockets.

Dr. Matthews arrived just before 9 P. M., prepared to remain during the night, and was a witness to his unmitigable distress. At 12.15 midnight, chloroform was again given by inhalation, he resisted it to the utmost, but in a few minutes became insensible. To sustain the anesthesia the napkin needed to be renewed with a full half dram of the chloroform every five minutes, and this quantity was hardly sufficient to suppress the convulsions. While resisting the administration of the chloroform he had thrown himself on the chest and was allowed to remain so, because it favored the discharge of saliva which was freely poured forth while he was unconscious.

He was retained in this state for one hour and ten minutes, when at the moment of renewing the medicine, as he was passing into a convulsion, he threw back his head and died.

Chloroform was not given with any hope that it would prolong life; its favorable action in puerperal and other forms of convulsions seemed to warrant its employment in this case; besides, Drs. Tyler, Ives and Bulkley consented to its use early in the day, likewise Dr. Townsend.

Dr. Matthews recommended it before he had any opportunity to assent to previous suggestions, and there was entire accord between this gentleman and myself regarding the propriety of not permitting a return to full consciousness unless there was evidence that the convulsions had ceased. There were some things worthy of particular notice in this case; the short period of incubation, the perfect freedom from anxiety respecting the

bite—as far as anything is known by his friends—in fact, he said repeatedly he believed the dog was not mad, and the *apparent* absence of all idea in his own mind as to what disorder possessed him. Once during its progress, after the delirium had seized him, he said, "Doctor, I didn't know but I was going to have Hydrophobia." The disease, counting from his first spasm, lasted thirty-one hours, counting from the time he took to his bed, two days and five hours; if we count from Saturday night, when the pain was first felt in the arm it lasted three days and six hours. The cicatrix appeared like any scar after a lacerated wound.

Early on the morning of the 1st day of June, 1848, Mr. Frank Pallman of Orange, accompanied by his brother, drove into the city on his usual route to deliver milk. He stopped at the corner of West street and Congress Avenue, when, as he entered the house, a large bull-dog brushed his nose against his legs. There was nothing about the animal to attract attention except his great size.

As the wagon proceeded on its way, he followed leisurely in its rear, and as often as Mr. Pallman alighted, approached him in a familiar manner, but showed no disposition to bite. A heavy rain had fallen the night before, and he occasionally disported himself in the pools of water that remained in the street. At the corner of Kossuth street, he began to spring at the nose of the horse; Mr. Pallman supposed it was playfulness, though he noticed that the horse tossed his head a little wildly. He shortly lagged behind the wagon and emitted a peculiar howl; the first thing which really alarmed Mr. Pallman. There was no frothing at the mouth, no wildness of the eye, only the peculiar tone of the dog's howl.

At the next stoppage, he trotted around the team, and returned again ahead of the horse; if the latter attempted to move he would fly at his face, and then Mr. Pallman saw that he bit him. His fears being now thoroughly awakened, he armed himself with some stones as he mounted his wagon. So soon as he started, the dog sprang with great ferocity at the horse, biting his nose, breast, shoulder, flank and legs. Mr. Pallman watched his opportunity and threw a large stone, which struck him a severe blow fair in the face. It staggered him for an instant, though he gave forth no cry of pain.

If the wagon stopped he would cease his attacks, and trot slowly around the team, but seeming never to take his eyes from the horse.

Mr. Pallman by his cries aroused a number of the inhabitants, and three men armed with billets of wood, four feet in length, took a position to check and destroy the rabid animal, but when the latter saw them, he seemed to comprehend the situation, and began to contest by attacking the men. One of them felled him to the earth at a blow, and his two companions struck him before he could rise. He fell back quickly, without any expression of pain, and with renewed ferocity again advanced to attack. Mr. Pallman says he rushed on, and actually struck with his paws the shoulders of one of the men, who pushed him away with his hands. This second onset so frightened the men that they withdrew to a house, and the dog was left master of the field.

Mr. Pallman now started his horse, at the top of his speed, toward the city, and immediately the dog darted at him, and at Mr. Pallman and his brother; the latter defended himself with a tin measure, and Mr. Pallman beat him off with the butt of his whip, and in this way they avoided being bitten.

At one time, near the Hospital, the dog leaped on the back of the horse, and was knocked off by Mr. Pallman, when he fastened his teeth just behind the shoulder, and clung there, very nearly throwing him to the ground, but was finally kicked away by the struggling horse, when he fell beneath the wagon, and the two right wheels passed over his body. (This morning the wagon contained one hundred and forty quarts of milk and two men.) He was apparently unharmed, for he gave not a single yelp, but at once charged on the horse.

At the corner of Cedar street, he again fell beneath the wagon, and the wheels passed over him the second time. He had now received some injury, or had become exhausted by the strife, for he loitered behind the wagon until it arrived at the corner of Church and Court streets, when his attention was diverted toward a small terrier which he chased to the Green.

In this remission Mr. Pallman sought assistance at the Police office; when he returned to the street, the large dog was driving the little one down Court street, and he never saw him afterwards.

Mr. Pallman freely applied brandy and vinegar to the wounds of the horse, and the next day cauterized with nitrate of silver every scratch, as thoroughly as was possible.

Many of the wounds were deeply lacerated, and by this time were much swollen.

For four weeks after the horse was bitten, he steadily lost flesh, notwithstanding he was liberally fed and took all the food that was given him. About the 28th day his appetite failed and he began to show signs of debility, and a mucous discharge appeared in the eye. On the morning of the 1st of July, his owner heard him biting the iron ring to which he was tied. It was not yet daylight and Mr. Pallman, before starting for the city warned his men not to go too near the horse. One man, disregarding the caution, went into the stall to remove the untouched food of the night before, when the horse snapped his teeth at him.

At 7 A. M. he ventured to prepare him for ploughing corn; it was difficult to adjust the bridle, on account of the continual snapping of his jaws. He seemed very weak as he was led out; he ploughed a few rows of corn, when he suddenly stopped, tossed his head and gnashed his teeth. His driver gave him a tap with the whip, when he reared high in air and threw himself on the ground in great rage, groaning and struggling vehemently.

When the fit had passed off, his driver raised him by the bridle; he went a few steps and again fell on his side, and the convulsions were repeated. After this, he was detached from the plough, and fastened with a chain to a tree, and how Mr. Pallman found him on his return from town, groaning in agony, his eye glaring wildly and his whole frame convulsed.

From Mr. Pallman's description, I judge that opisthotonos was a prominent symptom. In the intervals between the paroxysms, he was tolerably quiet, and in one of these intermissions, Mr. Pallman unhitched him from the tree and started him towards home.

He seemed desirous to arrive at his stable, and—though slight convulsions would occur every few minutes and were especially excited if the reins were drawn tightly—if allowed to take his own course, his own way, he was tolerably manageable.

Arriving at the stable, he was secured, and water was offered him; he plunged his head deep in the pail, but could not swallow. Mr. Pallman believed that no water passed his throat, and says he had the appearance of an animal that was choked.

In his convulsions he would groan and snort, and Mr. Pallman says some of the noises he made could be likened to the bark of a dog. Shaking a stick at him would make him furious.

Towards night a number of the neighbors gathered around, many of them gave freely their opinions respecting the nature of

the disease; some called it Colic, some one thing and some another, and remedies were suggested to meet the various diagnoses. The neighbors were not a whit less reluctant to prescribe medicines for the horse, than they would have been for its owner, had he been sick.

One man more daring than the rest declared the horse was not mad, and he passed into the stall by his side and stroked his neck; he was quiet now, and the man was so assured by his mildness, that he took a basin and offered him some barley, but by the time he had again approached him, the fury had returned, and as the man neared his head, he seized him suddenly by the waistcoat, dashed him to the floor, and would have destroyed him had not Mr. Pallman been quick enough to reach from the adjoining stall, catch the man by his clothing and rescue him from his peril. He had partially shielded himself with the basin from the mouth of the horse. Henceforth he expressed no doubt of the disease. At half-past five the same day the horse was shot in the head while in one of his paroxysms.

About noon on the 10th day of July, 1848, an unknown setter bitch* entered a dooryard in Whitneyville, bit a house-dog, quickly left the premises and made her way across that portion of the country which separates the two roads leading from New Haven to Centreville, a distance of a mile and a half, snapping at horses and other animals which happened to cross her path. She struck the road near the Hamden Plains Church.

In an adjoining pasture were two cows which she attacked, biting them severely about the head and shoulder. Leaving this point she took the railroad north for about a half mile, dashed into a yard where she bit a dog and then took her way across the fields, swimming a small pond which lay in her track and came out on the eastern Centerville road just north of the Whitneyville Church.

Near this, she charged towards a number of people who were holding a pic-nic, but did not bite any one of them. Her attention was then attracted by a cow, which she chased, and it was believed —though it was never made certain—that she bit her.

After this assault on the cow, she took the road north, for something more than a mile, until she arrived at the house of Mr. Enos

* I am particular to mention the sex, for not long ago an intelligent man made the assertion in my hearing, that the female of the canine race never suffered Hydrophobia.

Dickerman. A herd of cows, along with their calves were in an enclosure near the house, and into this the maddened animal plunged and commenced biting them promiscuously. She had her own way with this herd for about half an hour, when she was despatched with a rifle-shot. A number of swine were in the same yard with the cows; to these she paid no attention. Some of the cows were frightfully bitten, their ears and noses slit and otherwise mangled.

It is positively known that this animal had bitten two dogs, eight cows and one calf. The bitten dogs were immediately destroyed and the other animals were separated from the remainder of the herd. Every one of those bitten commenced almost immediately to lose flesh, although their food was not diminished, nor their appetites impaired. Two of the cows were sucked by calves which had not been bitten.

On the 17th day after the accident, one of the cows appeared rather strange, refused to eat and displayed the symptoms which are observed during the rutting season. Soon after, there was a peculiar restlessness, and a foaming mouth, a strange bellow and a continual lashing of the tail. If water was offered she would plunge her head in the pail, but could not drink. If provender were given, she would take it in her mouth, chew it spitefully and cast it away, either unable or unwilling to swallow it. She would tolerate the presence of a man, and in the early part of the disease submitted to be led and secured by her owner, but the sight of any of the lower animals would enrage her beyond control. All of the cows, after they were taken with the disease which were tested in this respect, manifested a particular antipathy to dogs; if one appeared they would bound towards it, pawing the earth, frothing at the mouth, bellowing fearfully and lashing their tails.

The first cow that was taken lived about sixty hours after she was attacked with the disease, never resting for a moment from her agitation, except when she fell to the ground from exhaustion, and finally died from asthenia.

All these animals which were taken exhibited the same or nearly the same symptoms; throwing water towards them, or any quick motion with the hand or a stick, would excite paroxysms of rage.

On the 18th day the calf was taken with the same symptoms and was allowed to live about 30 hours. The 22d day another

cow was taken and was shot as the paroxysms increased in violence. The 23d day one of the cows which were bitten near the Plains Church was attacked; she was a valuable beast and her owner was loth to destroy her, but as the disease progressed she became so outrageously wild, that he feared that she would escape, and at nightfall of the second day of the disease had her life taken.

The 38th day, the second cow which was bitten near the Plains Church was taken and killed the second day of the disease. On the 51st day two more of Mr. Dickerman's cows were attacked and were allowed to live until they became so weak that they could not rise from the ground, where they had fallen, when they were shot. The two other cows that were bitten, lived till sometime in November, when they were killed by a passing railroad train. At this time, they were greatly emaciated and their owner firmly believes they would have suffered the disease, had they not met with this accident. The calves which sucked the bitten cows did not cease to thrive.

One of the cows which belonged near the Plains Church was sucked by a calf the morning of her death. Her owner says, during that day the calf's bowels were disordered, the feces having an unnatural color and odor, but no permanent harm ensued.

With a little care we can disconnect the known from the simply conjectural in Hydrophobia; it is matter of history that the disease was recognized four centuries before the commencement of the Christian era. It is pretty generally admitted, though not positively established, that it may arise spontaneously in the dog, wolf and fox, yet in this order of animals it is almost always excited by contagion. The cause of its spontaneous appearance in the canine race is allotted to various reasons, no one of which is quite satisfactory. A committee on Hydrophobia constituted of three of its members was formed by the American Medical Association, who in the year 1856 reported that they agreed that the cause of its spontaneous appearance in the dog, was assignable to the constitutional irascibility of this animal; a conclusion which does not end a discussion of the subject, though perhaps it cannot be absolutely disproved. It is very nearly certain that it can be communicated to almost all animals—and every animal, of the class mammalia, can communicate it—though all species are not alike obnoxious to the contagion.

The dog and wolf are infected the most readily, then the horse, afterwards cattle, sheep, swine, rabbits, rats and man. There

is good foundation for the belief that a small proportion only, of animals that are bitten by mad dogs, escape Hydrophobia. Some forty years ago Breschet and Magendie performed a series of experiments with virus of rabid animals.

They inoculated horses, rabbits, guinea-pigs and birds all of these died, though they did not show an entire uniformity of symptoms. Breschet met with one mastiff which resisted inoculation, notwithstanding it was repeatedly tried, and with virus that had been proved.

Magendie successfully inoculated a dog with the saliva of a man who was sick with Hydrophobia. These experimenters believed the rabid saliva lost its virulence, by transmission through three or four animals of different species. They moistened sponges with rabic virus and placed them in the mouth and rectum of animals, without doing them harm; they inferred it was innocuous to an unabraded mucous surface. They also conveyed the virus to the stomachs of twenty-two dogs; no disease following, they concluded its digestion in the stomach was harmless. Breschet remarks with the utmost ingenuousness, that with a little care, we could, by inoculation, always have a supply of rabic virus on hand.

In a conversation with Dr. Tyler of this city, this gentleman called my attention to the ample testimony which is offered to show that man is much less susceptible to the contagion of rabies than the brute creation, and expressed his belief that a careful analysis of the evidence would lead one to more than suspect that the immunity claimed is apparent rather than real. John Hunter said that not more than one in twenty of those bitten by rabid dogs suffers Hydrophobia; Prof. Colles says fifteen escape where one has the disease, and Dr. Bright declared that Hydrophobia is no more likely to follow the bite of a mad dog than is tetanus to follow a lacerated wound. One statement is recorded, that four persons and twelve dogs were bitten, the men escaped, the dogs had the disease. Another relates that fifty-seven persons were bitten by rabid wolves, and forty perished with Hydrophobia. An enthusiastic Paris experimenter inoculated ten dogs with rabic virus. They became mad; instead of destroying them, he tied them in a bag and gave them to a porter to throw into the Seine; he, not knowing the condition of his freight, put his bag on the ground to refresh himself with wine by the way, when the dogs freed themselves, and scattering in different directions, bit sixty-

four persons; their wounds were cauterized, but notwithstanding the precaution, ten of the number died of Hydrophobia. Another account says fifteen persons were bitten by mad dogs, ten on the naked flesh; of these, five perished with Hydrophobia.

Of all the somewhat loose statements respecting the comparative susceptibility of man and animals to the contagion of rabies, this last is the only one wherein I have found mention of the bite being inflicted on the unprotected parts of the body; a most important circumstance to consider, in making up an opinion of the liability of man to this contagion. Of fifty-seven cases which I have found reported at length—for the most part in foreign Medical Journals, the part bitten is distinctly named in forty-eight of the number, viz., twenty-seven on the hand, thirteen on the face, one on the foot, one on the leg, one on the hip, and five on the arm. Of seventy-five cases embodied in the report of the Committee on Hydrophobia of the American Medical Association, forty were wounded on the hand, fifteen on the face, eleven on the leg, and nine on the arm.* These figures suggest the inquiry, does not the immunity of man depend more on the protection that clothing gives to his body, than to any natural indisposition to the infection?

The usual period of incubation in man varies from twenty days to six months. Of forty-two cases where the period between the reception of the wound and the commencement of the disease is recorded, it was three weeks and under in four cases—only ten days in one of these, two occurred in four weeks, nine in five weeks, two in six weeks, two in seven weeks, two in eight weeks, three in nine weeks, one in eleven weeks, two in thirteen weeks, seven occurred between the fourteenth and eighteenth week, one in the fifth and one in the sixth month, and one occurred in each of the tenth, eleventh, twelfth and fifteenth months. In the case where the incubative period was ten days, the patient was treated with mercury; the wounds had not ceased to suppurate, and had been dressed with mercurial ointment. In forty-five cases in which the duration of the disease is stated, the average time after the accession of the spasms was about forty-five hours; if two cases are excluded which lasted respectively four and eleven days, the average duration was a little less than forty hours.

* Before the statistics of the fifty-seven cases were collected, I was not aware that any paper like the report of the American Medical Association was in existence. All of the cases in this report (a most valuable document) were collected from domestic sources.

In twenty-three cases it was forty hours and under; the shortest was three hours. In fourteen cases it was between forty and fifty hours: between fifty and sixty hours in three cases, and between sixty and seventy-two hours in three cases. Autopsies were made in twenty of the fifty-seven cases; a very nearly constant appearance was a turgid condition of the vessels of the pia mater, with occasional effusion beneath the arachnoid.

In almost all, there is recorded a congestion or inflammation of the mucous membrane of the fauces. Rather frequent mention is made of congestion of the lungs. In one case there was extensive neuritis, in another gastritis. Where the condition of the blood is noticed, it is reported invariably fluid. Long ago it was agreed on all sides that Morbid Anatomy failed to shed any light on Hydrophobia.

Of the numerous theories which have been evolved respecting the nature of this disease, it may be said, that they are little better than so many admissions that nothing is known of its pathology. A good deal has been written to show that the poison is not absorbed, but forms a nidus in the bitten part, and is awakened by a secondary inflammation; a view which seemed to be corroborated by a renewal, or fancied renewal, in some cases, of the inflammatory process in the cicatrix, at the period of recrudescence, as it is called.

Every one of the animals that were bitten by the mad dogs in this vicinity began perceptibly to lose flesh almost immediately after the wounds were received, a fact which seems to prove, that the poison in these animals had arrived at, and was doing its work in the nervous centres which influence the processes of nutrition. A Russian physician named Marochetti made a curious declaration regarding Hydrophobia; he had lived many years in the South of Russia, where the disease is common; he asserted that sometime between the third and ninth day after the virus has been deposited, it is conveyed and lodged at the termination of the sublingual ducts; to prevent the disease, it should be liberated from the little vesicles in which it is enclosed, otherwise it will be reabsorbed, leaving no trace of its previous existence. This pretended discovery actually made a sensation in the medical world of that day. The author wrote an elaborate paper, setting it forth, which was published, and translated and re-translated into any number of languages. The American minister at Russia forwarded a copy to this country; it was printed in the American Medical Repository, 1822. Analogy lends no assistance in the so-

lution of the Pathology of this disease; if we consider its incubative period alone, it bears a closer relation to Syphilis than to any other malady which is the result of an animal poison, but the analogy ceases the moment the proper symptoms of the disease are manifested, when we would fain trace a resemblance to tetanus, but here we find that in the one the spasms are characterized by tonicity while in the other they are clonic. Besides, the mental phenomena, which are the peculiar symptoms of Hydrophobia—almost pathognomonic—are altogether absent in Tetanus.

Some thirty or forty years ago a respectable number of medical men were found, of no mean talents—who said there is no Hydrophobia; that the assemblage of symptoms to which that name was ascribed, and which they admitted always resulted in death, was the chimera of a disordered imagination. It was in vain that undeniable evidence was adduced in proof of its entity as a distinct disease, by citing instances of its appearance in all the higher animals, in men and women of all ages, in idiots and even in infants at the breast. A writer in the London Medical Times and Gazette of 1827, replied to that part of the argument relating to children, by challenging triumphantly the Hydrophobists, "to define the juvenile era, when the mind of a vivacious child has not begun to play upon his body."

In 1820 Mr. Robert White, an English surgeon, wrote a book of 146 octavo pages to show that Hydrophobia had no real existence, but was a species of Hysteria, aggravated by fear and meddlesome doctors, and he really seemed for the moment to get the better of his antagonists, in offering to prove the truth that was within him, by submitting himself to be inoculated with the saliva of a mad dog, under the supervision of a committee appointed by the Royal College Physicians.

Concerning locality, it would appear that hardly any portion of the habitable globe is exempt from this disease, though many places are named in books where Hydrophobia is never seen. South America at one time claimed entire immunity, but in the American Medical Repository is an account furnished by Surgeon Hedman of U. S. ship Ontario, of a large number of cases which had occurred in Peru, in 1804. Before this year, the writer says there is no previous record of the disease in that country. In 1847, on the Island of Malta, a dog from an English ship bit a cat, the cat bit a man, who four months afterwards died of Hydrophobia. T. Spencer Wells, who reports the case to the London Medical Times and Gazette of 1847, says the disease is unknown in

Malta, and adds further, that there is no word in the Maltese language to express Hydrophobia. It should be remarked that a more careful research brought out the fact, that two cases had occurred in Malta forty-two years previously. Dr. Mackintosh said he had never met a medical man who had ever seen a case of this disease in all Scotland, while in the adjoining portion of the same island it is not uncommon. It prevails extensively in Prussia and Russia, especially in those parts which are contiguous to great forests which are the retreats of wolves. Dr. Bardsly says that, in Prussia, for the ten years from 1810 to 1819 there was a yearly average of one hundred and sixty-six deaths from this disease. In the Sydenham year book for 1862 it is stated that two hundred and seventy-eight cases occurred in Berlin during the eight years between 1845 and 1853.

The truth probably is, that climate has nothing whatever to do with the propagation of the disease, and the question may be an open one, if its spontaneous production is affected by geographical lines.

The records show that it is much more common in the temperate than in the torrid zone, and it is an indisputable fact, and one which should be disseminated thoroughly, that it appears as often during the cold as during the warm season. Of one hundred and two cases which are contained in the report to the American Medical Association above alluded to, thirty-one occurred in the spring months, twenty-one in the summer, twenty-seven in the autumn, and twenty-three in the winter.

The somewhat redundant literature of Hydrophobia is burdened with loose, gossipy statements, a good deal of conjecture and some contradiction; there is a point however, in its history, where gossip and conjecture and controversy all cease. If there is anything positively determined, and admitted, by all intelligent and honorable medical men, respecting this disease, it is the inefficacy of all known drugs to cure the disorder or even to retard its progress.

Bloodvessels have been emptied of their contents, and bloodvessels have been deluged with fluid from without; the hot bath, cold bath and vapor bath; the whole list of narcotics, sedatives and stimulants has been tried; mercury, alcohol, opium, Belladonna, Digitalis and Prussic acid by the mouth, and tobacco and turpentine by the rectum; then, as if the baffled minds of practitioners sought relief in absurdities, things most inconsistent with common sense have been used and even lauded as cures for Hydrophobia.

If we except two or three cases, and these so carelessly reported that grave doubts are excited as to the genuineness of the disease, I have met with no case recorded by a medical man, of a recovery after this disease has once been established. But there is just as good as sworn evidence, that dipping patients in the mouth of the Severn river will cure Hydrophobia, provided they are immersed with their backs to the sea.

Many years ago the Legislature of the State of New York gave a handsome sum of money for the following prescription, (proportions unknown) which was warranted to cure Hydrophobia:—"A copper coin of Queen Anne's reign. The burnt jaw-bone of a dog, Phytolacca decandra, Serpentaria and Gum myrrh."

This prescription, slightly relieved of its ridiculousness, is still employed mysteriously, by men claiming to be respectable medical practitioners, who assert their power to cure Hydrophobia with the equivalent of the above named ingredients.

The prophylactic treatment of Hydrophobia is admitted to be of great importance. The three modes which best commend themselves, of dealing with the bite of a rabid animal, are excision, cauterization and the use of blisters; the blistered surface to be kept in a state of suppuration for a number of days.

It is unfortunate that we are forced to allow that all of these methods have failed, and that, too, when applied by competent hands, though it is certain that they offer a good chance for escape.

Excision, if properly performed, at the right time, is surer to prevent the disease than either of the other methods.

In the mind of Mr. Youatt, Hydrophobia was shorn of its terrors, could he apply thoroughly nitrate of silver immediately after being bitten by a rabid animal.

On the Continent of Europe blisters are a favorite mode of prevention.

ARTICLE XIV.

NOTES

ON THE USE OF THE VERATRUM VIRIDE.

Read before the New Haven County Society, April, 1860.

BY GEORGE A. WARD, M. D., OF NEW HAVEN.

My own experience with the Veratrum Viride, medically and surgically, has given me the highest opinion of its value as a remedial agent. From a large number of cases in my note book, I have selected the following, as examples of the prompt beneficial action of the remedy.

Case 1.—Mrs. C., an Irishwoman aged about 40 years, in a drunken affray in which her husband was killed, received a knife wound in the abdomen, about three inches in extent, through which the intestine protruded; she had been thrown upon the floor, and was covered with blood and dirt, the intestine being also covered with dirt. I washed the wound and intestine carefully with warm water, gently returned the protruded bowel, closed the wound with interrupted sutures, compress and bandage, gave her a grain of opium, and left; this was about midnight. Ten hours after I saw her, and found her hot and feverish; skin harsh and dry, pulse 100, full and hard, tongue heavily coated, abdomen slightly tender. I immediately prescribed as follows:

℞

Fluid Extract Veratrum Viride, (Tilden's,)	℥ss
Potassæ Chloratis,	ʒi
Aquæ,	℥iii

M.

Teaspoonful once in two hours.

Saw her again at 7 P. M., found her with soft moist skin, pulse 88, soft, no tenderness on pressure, edges of wound glued together with lymph. Has taken all the mixture. Ordered the veratrum continued, one drop once in three hours. Saw her at

9 A. M., pulse 72, skin moist, tongue clean, patient cheerful and comfortable. This patient recovered rapidly without a single bad symptom, although from her habits and mode of life I feared the case would have a fatal termination.

Case 2.—J. O. N., aged 24, a robust Irishman, in an affray received a knife wound in the right inguinal region, wounding the epigastric artery and penetrating the cavity of the abdomen, a small knuckle of intestine showing itself at the bottom of the wound; after placing a double ligature on the artery and dividing the artery between, the protruding gut was reduced, and the wound closed by interrupted sutures, carried down to the peritoneum, and dressed in the ordinary manner. Although the patient had lost a notable quantity of blood, twelve hours after the injury the pulse rose to 120, tenderness over the abdomen and symptoms of commencing peritonitis appeared. Four drops of Tilden's Fluid Extract of Veratrum Viride were given every three hours, which in twelve hours had reduced the pulse to 96 in the minute; this course of treatment was kept up with varying doses of veratrum for about a week, and at the end of a fortnight patient was discharged cured.

Case 3.—Ella C., a little girl about 6 years of age, of delicate constitution, was seen at 1 P. M., presenting all the symptoms of acute meningitis, pulse 160, hard, head hot and fiery to the touch, intense pain, delirium and nausea. ℞: Veratrum Viride 3 drops once in two hours in solution of Bismuth—mustard between the shoulders; half a grain of calomel with three grains of sugar to be placed on the tongue once in three hours, for the double purpose of allaying nausea and moving the bowels. A strip of muslin wet in ice water to the head, to be changed every minute. 7 P. M., pulse 152, soft, has slept some, veratrum one drop every hour; cold as usual. 9 A. M., rested fairly through the night, pulse 120, soft. Bowels moved gently during the night. The veratrum was kept up in varying doses for three full days and nights, and at longer intervals for three days more. Patient discharged well on the sixth day.

In this case it will be noticed that as soon as the influence of the veratrum was felt there was a marked change in the symptoms, the child becoming more tranquil, the pulse *lessened* in frequency and character, the skin from being hot and dry, became cool and moist, and the attack was at an end; with the exception of four doses of calomel and sugar (equal in all to two grains of calomel) there was no other medicine given.

Case 4.—This and the following case are stated that the contrast between the lancet and the veratrum may be observed. A robust Irishman, aged about 40, was found in bed complaining of severe pain in the chest, unable to draw a full breath, tongue heavily coated, pulse 100 full and hard. He had been seen the day before by another practitioner, who bled him to faintness, gave a dose of morphia and left. I immediately ordered a large mustard paste to the side, 4 drops of veratrum once in two hours, for three doses, after that to be continued once in six hours, Dover's powder 10 grains at bed-time, bowels to move by injection. Saw him the next day and found him at his barn feeding his pigs.

Case 5.—Mrs. H., American, a short, stout young woman, aged 24. Saw her at 5½ P. M., April 2d, 1864. Face flushed, eyes suffused and bloodshot, skin hot, pulse 160 in the minute, tongue heavily coated and dry, slight cough and lancinating pain in left side. Ordered four drops of Tilden's Veratrum once in three hours, mustard to the side, Compounded Dover's powder 10 grains at bed time.

April 3d, 1864, 9 A. M., had rather a restless night, perspired freely, took the veratrum once in three hours during the night without nausea. Pulse 88, tongue still heavily coated but moist. Skin moist, pain not so severe, is troubled to cough or draw a long breath; was directed to continue the veratrum once in four hours, Dover's powder at bed-time. April 4th, much improved, to have a dose of salts and senna. April 5th, up and about the house. Discharged.

The contrast between these cases will be perceived at a glance. In the one the abstraction of blood had given no relief. The Veratrum gave prompt and permanent relief. In the other the Veratrum was used from the outstart, and the next day all the symptoms improved, and the pulse was reduced nearly one half.

The Veratrum Viride is susceptible of a wide range of influence, but its peculiarly powerful effects are most marked in acute inflammatory affections, as for example, Meningitis, Orchitis, Peritonitis, Pneumonia, the Exanthemata, and all diseases characterized by increased arterial action.

In Hæmoptysis, the Veratrum Viride exerts a wonderful influence in calming the excited arterial system and thus aiding nature to close the bleeding orifice. In disease of the heart characterized by hurried or irregular action, I regard this remedy as of infinitely more importance than Digitalis in promoting a calm, steady action of the organ.

The great diversity of effects seen and opinions entertained, in regard to the use of this remedy, are due, I think, almost if not entirely to the varied strength of the article used.

I have tried every variety of the article, from some preparations getting no effects, from others slight, and others the full characteristics of the remedy. I now confine myself to the use of a saturated tincture of the fresh root, which I find uniformly reliable, and which I order or give in the following manner, as the mode of administration of the remedy is of importance as regards the effects produced.

℞

Sat. Tr. Verat. Viride,	℥i
Potassæ Chlorat.,	℈ii
Aqua,	℥ii

M.

If to a child I add a little syrup. I also use the chlorate of soda instead of the potassa, as the taste is more cooling and agreeable. Dose: One teaspoonful every two hours, for three doses, once in three hours for two doses, once in four hours for two or three doses, according to the effect produced, and if necessary returning to the starting point. By giving it in this manner the remedy can be used for weeks, without producing any deleterious effects upon the system at large or even exciting emesis.

The chlorate of potass, or soda exerts a beneficial effect in keeping the mouth and fauces in a soft, moist condition, correcting fœtor, and loosening the viscid secretions which are so often a troublesome symptom.

Too little thought has been given to this remedy in a surgical point of view, though of late I see it is coming more and more into use. Prof. H. R. Storer speaks highly of it as controlling the tendency to peritonitis, after abdominal section;—and Cumin, in his admirable Manual of Surgery based on Pathology, narrates, pages 87, 88, two very interesting cases of wound of the lung, (in one case the ball passing directly through the lung,) treated by Veratrum Viride, and speaks of the great value of the agent, as an antiphlogistic and diaphoretic.

In regard to the poisonous qualities of the drug, I do not believe the stomach can be made to retain a sufficient quantity to kill a person. Nature has so surrounded the alkaloid which reduces the pulse, (and it does that and nothing more) with a principle which causes all superfluous quantities to be thrown off, and when that effect once takes place I will defy any

one, to get any more of the article into the stomach to be retained there.

A word as to the treatment when an over dose has been taken. The books and journals advise brandy or alcohol; it is my impression that those who gave the advice never tried the remedy in their own persons; had they done so, the advice were never given. My own plan is either to let the patient alone altogether, or else apply dry warmth to the extremities and stomach. Morphia internally in as small quantity as possible, or better yet Morphia subcutaneously administered.

ARTICLE XV.

NOTES ON SUBCUTANEOUS INJECTION

OF

MORPHIA, ATROPIA AND STRYCHNIA.

Read before the New Haven County Medical Society, October, 1861.

BY GEORGE A. WARD, M. D., OF NEW HAVEN.

During the past year I have been making trial of subcutaneous medication. Some of the phenomena observed I propose very briefly to state.

Case 1.—A strong robust man was suffering severely with painter's colic. I ordered topical applications, ¼ grain doses of Morphia every two hours internally, and Croton oil, one drop every hour, until the bowels moved; this was in the evening. Saw him in the morning, no relief from pain, no evacuation from bowels, persistent nausea and vomiting. He had taken and retained two grains of Morphia and about 10 drops of Croton oil, in pill, in addition to a box of Ayres' pills which he had taken before I saw him. I immediately injected one-half grain of Morphia under the skin in the epigastric region, and before I could put my instrument in its case, his bowels had moved profusely, and the colic was at an end.

Painters colic I never treat in any other way than by Morphia subcutaneously, and Croton oil in drop doses, (made into a pill with bread crumbs,) until the bowels move.

The antagonistic effects of opium and its alkaloids, and Belladonna and its alkaloid atropia, furnish a fruitful source for investigation. There is an abundance of evidence on record as to the favorable influence exerted by Belladonna, in cases of opium poisoning; and on the other hand perhaps as great an amount of evidence of the intensifying action of these remedies upon each other.

A case of opium poisoning reported by Dr. Morris, Penn. Hospital, Braithwaite, July, 1868, page 241, in which the patient swallowed, as near as could be ascertained, 75 grains of Morphia, was given 50 grains of the extract of Belladonna in connection with other plans of treatment. This is supposed to be the largest dose of Morphia taken with poisonous intent in which recovery has taken place. The article by Dr. Morris is a very exhaustive one, and gives the details of several other cases, as well as a summary of the literature of the antagonistics of the remedies. A tabular arrangement of cases of recovery from opium poisoning, treated by Belladonna, will be found in the American Journal of Medical Science, October, 1862, page 398. In the N. Y. Medical Record, for August 15th, 1868, page 267, a case is related of opium poisoning treated by the subcutaneous injection of atropia. In this case one-half grain of Morphia had been subcutaneously injected, and although the patient had been in the habit of using Morphia in this manner, poisonous effects were induced. Artificial respiration was resorted to, and two doses of the $\frac{1}{100}$th of a grain each of Atropia were injected, the patient recovering consciousness within fifty minutes after receiving the first injection.

As instances of the intensifying action of these remedies upon each other, I will only relate two cases.

Mr. A., a man somewhat advanced in life suffers severely with Neuralgia. Morphia to the extent of $\frac{1}{4}$ of a grain was used subcutaneously with the effect of relieving all pain, but producing prolonged wakefulness. He would lie in bed, as he says, perfectly happy and contented, but unable to sleep. On the 24th and 27th of August he was injected with Morphia, gr. $\frac{1}{4}$, Atropia gr. $\frac{1}{100}$. The result of which was (to use his own words) "to procure the most delightful night's rest he had ever had in his life."

Mrs. D., belribben, who has been in the habit of sleeping during the day, and making night hideous with her groans, received $\frac{1}{4}$ of a grain of Morphia subcutaneously, which had no effect upon her except perhaps to intensify her groans and howls. The addition of the $\frac{1}{100}$th of a grain of Atropia gave her a full night's rest. This plan of treatment was continued for a length of time with complete success, until death kindly stepped in and relieved her of her sufferings.

Mr. Hasley, whose labors in investigating the action and uses of remedies, are well known, states in an abstract, Braithwaite, July, 1868, page 267, a number of cases of disease

treated by the subcutaneous injection of Atropia. As the results of his experiments he draws the following conclusions. The kidneys are very active in eliminating the remedy from the moment in which it enters the system, and it is ordinarily entirely removed from the system in the course of two or three hours. During the operation of the remedy, the amount of urea excreted is increased, as well as the sulphates and phosphates. He also states that it is a powerful cardiac stimulant, and as such should be used in all cases of failure of the heart's action, and depression of the sympathetic nervous influence; hence useful in the collapse of cholera and the failure of the heart's action from chloroform, &c. He speaks of its use in Rheumatic fever. I have only used the remedy in Chronic Rheumatism, where the joints were stiff and painful. I injected five patients with Atropia, gradually increasing the dose, never using less than the $\frac{1}{12}$th of a grain nor more than the $\frac{1}{6}$th of a grain. In all of the cases they expressed themselves very much benefitted, and with one exception could walk better and suffered little or no pain.

Case 1.—W. B., Chronic Rheumatism and Sciatica, suffers constant pain, can scarcely walk, appetite poor and has a general feeble and anæmic look. This patient was injected with the Atropia nineteen times, commencing with the $\frac{1}{12}$th of a grain and gradually increasing to the $\frac{1}{6}$th of a grain. He has gained steadily in health, flesh and strength, and his pain has been gone for weeks.

Case 2.—Mr. W., Irishman, age 40. Disease, Phthisis and Chronic Rheumatism. Knees not swollen but very painful. Injected, August 8th, $\frac{1}{12}$th of a grain of Atropia. August 9th, injected $\frac{1}{12}$th of grain. August 10th, expresses great relief from the pain, complains of extreme dryness of throat. August 11th, injected $\frac{1}{12}$th of a grain. August 13th, laid aside his cane.

This patient received ten injections, which gave him very great relief from the pain he had so constantly suffered previously.

On commencing my term of service in the Conn. Gen'l Hospital, July 1st, 1858, I learned that my predecessor, Dr. Dibble, had been resorting to subcutaneous injections of Strychnia in several cases of paralysis then in the Hospital, and with little or no benefit to the patients. Determining to test the value of the remedy used in this manner, I commenced the use of the injections, starting with the $\frac{1}{30}$th of a grain as the minimum dose and gradually increasing the dose, until I reached in one case the $\frac{1}{4}$th of a grain.

The solution which I first used was made from the powder of Strychnia prepared by Powers and Weightman, and from its red color with nitric acid it contained a notable quantity of Brucia. I afterwards used the crystals of Strychnia in preparing the solution and obtained more decided effects.

I will not detain you by an enumeration of the different symptoms in each case, as they are well laid down by Echeverria, Trans. Conn. Med. Soc., 1848, and by Chas. Hunter, Braithwaite's Retrospect, July, 1848, page 33 to 38. The symptoms produced vary but little, except in some cases I have observed a remarkable tolerance of the remedy. Thus far I cannot say that I have seen any very great benefit from its use; perhaps I have not carried my instrument deeply enough into the tissues, having been contented with simply injecting under the skin. It is a remedy well worth a trial, and it is probably more suited to cases of recent paralysis, and where serious lesion of the brain is not at the bottom of the disorder.

Case 1.—S., a soldier, loss of motion of lower extremities, involuntary micturation, and defecation, induced by exposure in service.

Previous to my seeing him he had been injected by Dr. Dibble, a number of times. I injected, July 8th, one-twentieth of a grain under the skin over the anterior face of the tibia, and gradually increased the dose, until at the 13th injection, July 24th, he received one-fifth of a grain, and received it for three consecutive doses, i. e., on the 28th and 31st. Here the treatment was discontinued for a time, as the patient went home for a short visit, very much improved as far as control over the sphincters was concerned. He could also walk after a fashion. This was decidedly the most promising case I observed. The treatment was resumed on the 6th of August, and kept up for a time with steady improvement. After the 6th of August, I am unable to state the number of punctures received before his discharge from the Hospital, for disobedience to the rules.

Case 2.—A. P., male, soldier. Paralysis affecting the left side more particularly, caused by exposure in service, disease five years standing. Received no benefit, treatment discontinued after he had received the 8th injection of $\frac{1}{4}$th of a grain, which caused extreme rigidity of the muscles, particularly of the face, right side, attended by profuse clammy sweat.

Case 3.—German, Paralysis of right arm following sun stroke;

right arm of very little use to him, was injected six times. August 8, $\frac{1}{20}$th of a grain. August 9, $\frac{1}{20}$th of a grain. August 11th, intending to give the $\frac{1}{20}$th of a grain, I injected 30 minims of a solution which was equal to about the $\frac{1}{40}$th of a grain! asking him the next day whether he felt any effect from the remedy, he replied "a little." I gave him up as a hard case after decreasing the dose to $\frac{1}{30}$th of a grain. The only effect perceived in this case was slightly increased warmth of the arm.

Case 4.—Mr. R., paralysed about six years, has tried a variety of remedies with little or no benefit, sits in a wheel chair most of the time.

August 4th, injected $\frac{1}{20}$th of a grain. August 7th, injected $\frac{1}{20}$th of a grain. August 8th, injected $\frac{1}{20}$th of a grain; says he felt slight twitches in the affected arm on the 7th inst. August 9th, injected $\frac{1}{20}$th of a grain. Says he felt the injection of the previous day all over; it seemed as if he was in a fiery furnace, the arm is much warmer, to the hand the temperature is above the sound arm. This patient has received about twenty injections in all, the doses varying about the $\frac{1}{20}$th of a grain, which he says suits him best; he is still under treatment and I think he is improving.*

Case 5.—Mrs. S., aphasia, total loss of power of right arm; fingers tightly flexed, and hand on forearm, disease of unknown duration. Injected three times, each time the $\frac{1}{20}$th of a grain; it had the effect of making the hand and arm warmer, and the thumb could be moved more freely. This woman was at times subject to violent paroxysms of rage; one morning I left her room very suddenly and have not seen her since.†

I have used the remedy in a number of cases, but with little benefit. The class of patients found in an alms house, (where most of my injections have been made,) offer very little chance for the good effects of any remedy.

The increase of temperature which was noted in all the cases usually persists for a length of time even after the remedy is discontinued.

Strychnia has been used endermically in a variety of diseases, principally in paralysis and amaurosis. The dose was $\frac{1}{4}$ to $\frac{1}{3}$ grain twice daily until tremors in the limbs were produced.

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* The injections were kept up for some time longer, but at last became an old story to both patient and physician and were discontinued.

† This patient has since died, an autopsy revealed extensive losing of the brain.

In Dunglison's New Remedies, edition 1845, page 572, is found an account of the nearest approach to subcutaneous injection of Strychnia, which I have been able to find. Patient suffering from amaurosis.

One grain of Sulphate of Strychnia was dissolved in two drops of water. On the first day twelve inoculations were practiced; six above the eye in the course of the supraorbitar nerve, six below near the termination of the nasal nerve.

On that day no effect was produced, on the next day slight tremors occurred in the neighborhood of the inoculated spots. After a rest of two days, eighteen punctures were made; patient was fully cured, after the lapse of two months and the use of five grains of Strychnia.

I am under great obligations to Mr. Alling, resident physician at the Hospital, for his care in keeping a record of a number of injections, effects, &c.*

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* Since the above was read I have seen a case of local palsy, and a case of aphonia, cured by subcutaneous injection of Strychnia. Maximum dose, gr. $\frac{1}{30}$, in minim $\frac{1}{100}$. W.

ARTICLE XVI.

REPORT

OF A

CASE OF SUPRA-RENAL MELASMA,

Or ADDISON'S DISEASE.

Read before the New Haven County Society.

BY S. G. HUBBARD, M. D., OF NEW HAVEN.

The physiological relations which the supra-renal capsules sustain in the animal economy, have always been, and are still undetermined; the opinions of investigators varying as widely as possible from each other, and changing with every generation.

That they are the subjects of disease and structural change was accepted as true; but all attempts to connect these changes with any special pathological condition, or with any external manifestations of disease failed, until Dr. Addison of London, in 1855, showed the remarkable association of disorganized supra-renal capsules, with a peculiar pigmentation of the skin and mucous surfaces; and with a deranged condition of certain vital functions, as indicated by marked and progressive emaciation, defective hæmatosis, a feebly acting heart, an irritable stomach, and very great loss of muscular power; to which subsequent observers have added, impaired memory.

Without making a more precise and extended statement of the views contained in Dr. Addison's paper, which by common consent marks an epoch in the progress of practical medicine, and has connected his name with a hitherto unnamed disease, it is sufficient to say here, that his very clear and graphic description, admirably depicts the appearance of the patient, and the symptoms of the disease; and in all the published reports of such cases since it was written, there is singular uniformity, and confirmation of its accuracy.

The history, symptoms, and *post mortem* appearances of the following case are fully corroborative of the general statement. This as well as the interesting nature of this extremely rare, and thus far incurable disease, has seemed to me sufficient reason for presenting it to the notice of the Society.

H. B. S. Male, aged 44 years, a single man—by profession a banker, had occasionally come under my professional observation, during the last fifteen years. He was of a strumous constitution, but of strong bodily frame, and seldom had been seriously sick—although he had for a long time, until three or four years ago, suffered from very severe pains and soreness in the right lumbar region, with considerable disturbance of the renal functions, for which he had been variously treated without avail. These symptoms ceased to trouble him while drinking the waters of St. Catharine's Well, Canada, and as he thought in consequence of it; but which the examination *post mortem*, showed was due to another cause. When I was called to him in July, 1865, the most striking feature of the case, was the deep bronze color of the skin upon the face and hands, and other parts exposed to light. The color was in broad patches of dark brown bronze, upon a ground of lighter brown hue, that pervaded the entire surface. Some of the patches were olive black in tint, resembling the color of a mulatto—especially the surfaces of cicatrices, and the mucous membrane of the lips and the ala of the nose. The conjunctivæ and the finger nails, were pearly white.

From his own statements of his case, I learned that for some weeks past his appetite had failed, and there was steadily progressive emaciation—the stomach was very irritable—there was great failure of muscular strength, and memory—the bowels were regular and the urine passed normally.

His hair which had been lustrous, was now faded, dead and split, and his whole appearance was extremely anæmic and cachectic, without fever. The action of the heart was very feeble and the radial pulse 80 in a minute—large, soft and easily compressible.

The treatment was directed to improving as much as possible the general health, but with unsatisfactory results; and a voyage to Europe was recommended. He returned much improved in flesh and strength, but the bronze color was deeper, and more extensive, being very dark on the penis and scrotum—in the axillæ and about the joints in the line of extension. Since that period, particularly for the last year, there had been marked

improvement in all respects, even in the color of the skin, which was several shades lighter; and his general health had so much improved that he engaged somewhat in business, and thought he was getting well.

He returned from a journey on the 10th of August feeling very feeble and unwell, but received no medical attendance. He was found next morning in his room, partially dressed, and in a dying condition—living but a few moments.

Autopsy made by Professor White, six hours after death—showed rigor mortis very strong; the entire surface of the body presented the bronze discoloration of the skin with irregular patches of darker color in various places; the degree of embonpoint was considerable, nearly an inch of fat covering the abdominal muscles.

The left lung was firmly and extensively adherent, and a few miliary tubercles were seen, but had never revealed themselves by any physical sign; the right lung was in a normal condition.

The heart was small and its walls were thin; the right auricle was very diminutive in size, merely rudimentary in its development.

In the right ventricle was found a fibrinous clot of great firmness, two and a half inches long and an inch in width at its free extremity, hanging loosely in the vessel, and which sufficiently accounted for his sudden death. The valves of the heart were healthy, though the walls of the aorta presented an extensive atheromatous deposit. Spleen and pancreas healthy.

The liver was much enlarged, but was otherwise normal; it was not weighed.

The right kidney, which early in the history of the case had been the seat of much pain, was entirely disorganized, and converted into a lobulated mass of abscesses, filled with a white odorless paste, of the consistence of thick paint. The capsule of this kidney, as is frequently the case, was wanting. The left kidney was double the usual size, but comparatively healthy. The supra-renal capsule of this side was much hypertrophied—very solid and hard, presenting no cavity, but having several nodules of cheesy matter upon its surface. Under the microscope it showed merely hypertrophied tissue.

The bladder was healthy, and contained a small amount of urine, in which upon analysis was found molecular fat and amorphous phosphates.

This case is chiefly remarkable for the long duration of the disease, fully three years, and for the fact that apparently it might

have continued for years longer, but for the "embolism" in the right ventricle of the heart.

Of the pathology of this most interesting disease, I can say but little. In most of the cases reported, the capsules are found filled with a cheesy matter very like that which is met with in other glands, and which we call "strumous"—yet Dr. Wilkes, who is considered as the highest authority on the subject, believes the deposit to be *sui generis*, neither cancer, melanosis, nor tubercle. He says it is deposited first as a translucent, solid homogeneous substance, subsequently degenerates into a yellowish white matter, and afterward softens into a so-called abscess, dries up into a chalky mass

That the change in the color of the skin is due to excessive pigmentary deposit in the deeper layers of the cuticle, has been repeatedly proved by microscopic examination; but the source whence this pigment is derived, and the determining cause of the deposit of it in Addison's disease, are entirely unknown. It has been thought probable from the following considerations, that the coloring matter of the solids and fluids of the body, in the state of health, is derived directly from the blood, and results directly from the solution of its red corpuscles.

Experiments have shown that from $\frac{1}{3}$ to the entire quantity of the blood of a vertebrate animal, is replaced and renewed from the lymph and chyle every twenty-four hours.

The corpuscles of this displaced blood must undergo solution or liquefaction, as a preliminary step to their elimination from the body; and it is probable that they are dissolved in effecting the last stage of assimilation or elaboration of the nutritive materials of the tissues.

In extreme cases of anæmia, in which the red corpuscles are greatly diminished, as in leucocythæmia, to which Addison's disease seems to be allied, that the urine is devoid of its ordinary coloring matter, *uro-hæmatin*. Hæmatin, in the purest state in which it is possible to obtain it from the blood, is of a dark brown color, insoluble in water, and not liable to change on exposure to gases.

The pigmentation of the skin in Addison's disease results probably, either from arrest of the process of molecular disintegration of the colored cells of the cuticle, or from excessive destruction of the red blood corpuscles, and the consequent abnormal deposit of the escaped coloring matter, or *pure hæmatin*, in the *rete mucosum*, in its passage to the outer surface of the cuticle, whence it is to

be discharged from the body; the latter view is rendered more probable, by the fact already noticed, viz: that in all the cases of supra-renal melasma, in which the blood has been examined, the white corpuscles have been found in relative excess. (Dr. Hayden, in Dublin Journal, No. 77.)

Although "bronzed skin" has been proved to sustain an intimate relation to certain diseased states of the supra-renal capsules, yet the extent of the relationship, and the pathological significance of the morbid states thus connected, are still subjects of dispute.

Morbid states of those bodies are not always connected with bronzing of the skin; and it would seem that symptoms and phenomena of a very important character have been lost sight of when describing this constitutional disease, while an undue importance has been given to bronzing of the skin. It is to the *cachexia*, that Dr. Addison called special attention, but his commentators, carried away by the inquiry regarding the color of the skin and its connection with disease of the supra-renal capsules, have overlooked the more important part of his observations, which was that the *bronzing of the skin* should be looked upon as a valuable symptom of a prevailing constitutional cachexia, which establishes itself with extreme insidiousness, and of which the curable stage, if there is any, has passed long before the bronzed color of the skin attracts special attention.

The marked improvement of the patient whose case I have stated, was very decided, and up to the time of his sudden death from a cause which perhaps had no connection with the bronzing of the skin, had been steadily progressive, illustrates the importance of prescribing for the existing condition of the patient, and not for a disease by name.

Mrs. S—, a married woman, now 40 years of age, consulted me more than nine years ago for a similar train of cachectic symptoms as those before described. She had progressive emaciation and loss of muscular power, and impaired memory with confusion of intellect at times, great nervous irritability, delicate stomach, constipated bowels, a feebly acting heart and a very peculiar head-ache; she had no renal or uterine disturbances, or evidences of tuberculosis.

She was persistently treated with mineral tonics, alteratives, and such hygienic measures as would best promote the general health, for more than two years, when dark bronzed patches appeared on the forehead and face, without amelioration of her anæmic condition, and I then first began to suspect the real nature

of the disease. The treatment has been continued, and she is still under occasional observation, and apparently is steadily, but slowly improving; the discoloration of the skin, however, remains unchanged.

For these few years past, I have come to consider this a case of Addison's disease, which has at least been kept in abeyance by treatment, and I shall continue to watch its progress with unabated interest.

ARTICLE XVII.

VITAL FORCE.

Read before the New Haven County Meeting, April, 1860.

BY M. C. WHITE, M. D., OF NEW HAVEN.

Vital Force is a term which at various periods in the progress of science has been employed with very different significations.

In considering the subject of *vital forces*, I shall not feel bound to explain, confirm or refute what others have called vital force, but only what I consider properly and truly described by that term.

Every object of study having an existence which may be regarded as able to subsist independent of every other thing or being, except its Creator, may be called *Substance*. The term substance is very nearly equivalent to the term *being* as used in the older works on logic.

Substances are of two classes, viz:

1st, Matter which occupies space and is an object of sense.

2nd, Mind or spirit which is a substance not directly cognizable by the senses, but known to us only as it acts upon matter, or is acted upon by matter.

In the language of theologians the Infinite Spirit is a Substance, as they say,

"The Three Persons of the Glorious Trinity in the Godhead are of *One Substance*, Power and Eternity."

If then spirits are real *beings*—if they are substances—we have *material substances* and *immaterial substances*, and their relations to each other cannot be wholly ignored in considering *what is vital force?*

Rev. Nathaniel W. Taylor, D. D., was accustomed in his lectures on mental philosophy, to dwell with great emphasis on the fundamental fact in Metaphysics, that "The Soul is a Self-Active Substance, possessed of intellect, sensibilities and will."

The Soul is a Substance. Matter is a Substance.

These two great classes of substances have then certain great characteristics in common. Spirit being an immaterial substance

is not matter, nor any property of matter. It is not generated by matter or any combination of material things.

I am not one of those who believe that Vital Force is opposed to Chemical Force. I am willing to go as far as any one can in admitting that all organic compounds are formed by the action of the molecular forces known as chemical affinity, and that if the same molecular conditions which exist in organized beings could be imitated in dead matter, the same organic compounds would be formed as in bodies which manifest the phenomena which we call life.

It has been beautifully shown by Dr. Chambers in his work on the 'Renewal of Life,' that in living animals decay and disintegration go on with the same rapidity as in animal matter destitute of life. In living animals, assimilation and renewal of the organism keep pace with the progress of decay, hence the *form* is retained while the atoms and molecules undergo constant change.

Life consists essentially in the disintegration and renewal of the organized structure with the manifestation of certain forces developed by the changes effected, which changes are known as manifestations of force in organized beings; as heat, motion, electricity. I shall not stop to consider whether muscular force is vital force. I at once admit that muscular force is developed by, and exactly proportioned to, certain chemical changes in the body which, if effected outside of an organized body, would develop the same amount of mechanical force of some form, either heat, electricity or mechanical motion.

Is it vital force which controls the structural development of a vegetable or an animal cell?

The nucleus attracts to itself matter in which it effects molecular (chemical) changes, and then *repels certain portions* of that matter to form a cell wall, whose dimensions are limited by the repulsive force of the nucleus; hence formed material is built up into a structure.

This action of organic matter is closely related in appearance to the action of a pith ball, charged with electricity which first attracts light substances, and then repels them to a distance determined by the intensity of its electric charge.

This force which builds up an organized structure may or may not be vital force, quite likely it is only a peculiar manifestation of the molecular force of matter.

Why does one cell differ from another cell formed, so far as can be perceived, of the same pabulum?

Here we enter on doubtful ground, where the molecular forces of matter as seen outside of organised beings, do not enable us to explain the phenomena. But here even we will not positively assert that the work performed may not follow the well known laws of inorganic matter.

Let us go a step farther. Why do the organized cells of the ova, originally developed from one single cell, go on differentiating and developing at one extremity a head, at one angle an arm, and at another a foot, in one part cells that suck in or attract phosphate of lime and form bone, at another part phosphoric acid, &c., to form nerve structures and brain?

Whence this elective affinity by which an organism is formed of strangely dissimilar parts united into one symmetrical and mutually dependent harmonious whole? Here are controlling forces not recognizable as by any possibility growing out of the forces contained in any *single* atom of matter or aggregation of atoms. Here is a manifestation essentially and constantly connected with organized bodies, and which is probably a characteristic of vitality —a *vital* force as distinguished from inorganic forces.

This variety of vital force we may perhaps with propriety denominate Formative Force. We see not spirit here as yet, yet there is something, a form of force which is not an essential to any of our ideas of material atoms, or the molecular forces which hold dissimilar atoms united into compound molecules.

Let us go a step farther and consider the organized being, of the type we call animal, manifesting muscular and nervous force.

Muscular force depends on oxidation of organic compounds either in muscles or in the blood. Without oxidation, not a muscle can move. But what determines the oxidation? or what changes the chemical force of the oxygen into heat? and the heat into muscular force? The nerves we are told excite and govern the change. What governs the nerves? Molecular changes in the brain or other nerve-cells. What controls these changes in the nerve-cells? Why simply some abstract proposition placed before the mind, or originating in it, which has no sort of relation to any property of what we call matter.

Odling (Animal Chemistry, page 108) says: Chemists and Physicists are well assured that be life what it may, it is not a generator, *but only a transformer*, of external force.

Here I think is a fallacy, I prefer to say:—An organized structure is a transformer of external force so long as it is kept in motion by vitality, be vitality what it may.

The force which throws the ball from the rifle was previously stored up in the powder. What set loose the force of the powder? The sudden concussion which brought the particles or molecules of the percussion powder within the limit of chemical affinity. Call the rifle loaded with powder, ball, &c., the representative of the animal organism. The force to make the ball fly through the air is stored up in the powder. The directing hand must pull the trigger, or the external force which moves the ball would not be transformed from *pent up force* to force in action. Vitality "*do it when it may*" is a force which lets loose the molecular forces which move the organism.

Is the rifle discharged without a force applied to the trigger? No! Neither is the pent up force in food, blood or muscle *transformed* without the action of some force not material, and which cannot be measured by material forces. It is not material force but still it is a *force*. As it is not inherent in matter though it acts upon matter, as the man acts on the rifle, it cannot be measured by or compared with a material force. It is a *vital force*, acting not constantly but only when immaterial things act upon material. Its highest manifestation is seen when mind acts upon matter. When ideas, feelings, emotions, control the development of force, and set in motion, liberate, or restrain material forces.

Take another example. A man hears that his Father is dead in a distant city. He is convulsed with sorrow,—he prepares at once to visit the home of his childhood and follow the remains of his father to their last home. There was nothing mechanical or physical in the influence of the words spoken, which could set in motion or restrain nervous or muscular force. Here certain relations, not physical, not material, but perceived by the mind, cause the mind to act upon matter and determine certain physical changes. This I call a manifestation of *vital force*.

We cannot explain attraction of gravitation. We cannot even conceive it to be any modification of heat or light. We cannot understand how it acts, yet from experience we say it is a property of the atoms of matter.

We see that organization of matter is dependant on some energy which exists or existed in connection with pre-existing organized matter.

This organizing force we are well assured *exists* as really as the force of gravitation. We never see this force exercised except

by living things, hence we call it *Vital Energy* or *Vital Force*, as contradistinguished from the forces which we see manifested in inorganic matter.

While studying this subject, I have met with an author, some of whose views so nearly agree with my own, that I shall quote them.*

"There remains a mystery in the manifestation of feeling and consciousness in connection with matter, even when contemplated in the case of animals, which no physical hypothesis has yet cleared up. Moreover, the vital phenomena dependent on the higher organizing or metamorphic property, cannot at present be so explained, nor is it easy to conceive the *possibility* of so explaining them, by reference merely to mutations of the universal physical force, which undoubtedly subserves, and is essential to their manifestation.

"The formation of a fluid or solid mass of albuminoid protoplasm may be conceived to be due to a vito-chemical process, and its maintainence to vito-chemical changes; but the *shaping* of this to an organic form, whether a nucleus, a naked nucleated cell or zymoplast, or a perfect cell with envelope or cystoplast, or the multiplication, modification, and adhesion of these in definite order, manner, and connection, to form a complex animal or vegetable, implies the presence of some further controlling power.

"There would seem indeed to be some special force in animals and plants, by which the tissues, parts and organs are evolved in determinate shape, size and position, and are definitely endowed with their ordinary properties; and by which moreover, entire organisms are developed in apparently endless variation, according to the distinctions of kingdoms, classes, orders, genera, species, race, sex and individuality.

"These remarkable phenomena are accordingly said to imply the presence of a *guiding, controlling* and *distinctive force*, modified in innumerable ways by external and internal conditions, transmissible from generation to generation, and certainly distinct from, though co-operating with, the common physical force of nature.

"This is truly a *vital force*—a force properly called organic—on which the very existence of both animal and vegetable organisms depends.

"It is this force also known as the germ force which develops and maintains the body and all its parts, with their respective vito-physical, vito-chemical, and other so called vital properties, and so imparts to them their very highest endowments."

* Marshall's Physiology, *American Edition*, pp. 92, 93.

This vital force so conclusively shown to exist, though it does not prevent the constant action of chemical forces, disintegrating molecules and reforming new ones on the same pattern, yet it does resist disorganization and destruction of organic forms.

Archimedes said that if he had a suitable fulcrum on which to support his *lever* he would move the world. If we had a suitable instrument we might measure this vital force, but though we know that immaterial substances exist we cannot analyze them for want of proper *crucibles* and *tests*. Yet when considering the multitudinous changes effected in *material things* we ought not to ignore the action of *immaterial things* which we know do act upon the material. *Mind* acts upon *matter*. The forces essentially connected with material atoms are by no means the only forces acting in nature. As there are two great divisions of substances, the material and the immaterial, there are two great divisions of *forces*—material forces, and organic or vital forces.

Our knowledge of matter is yet very imperfect, and our knowledge of immaterial substances is in the first dawn of infancy, yet in our study of nature it is proper that we should recognize and consider that great agent in nature, VITAL FORCE.

ARTICLE XVIII.

POISONOUS WATER COLORS.

BY STEPHEN G. RISLEY, M. D., OF ROCKVILLE.

Two female operatives in one of our manufacturing establishments were taken ill about the same time, last autumn. Their employment had made it necessary for them to use water color paints, such as are for sale, at a low price, in the shops, put up in cakes in boxes, for the amusement of amateur juvenile painters. These paints were used to correct slight imperfections in color, on the surface of woolen cloths; the custom of the girls being to moisten the cake on the tongue before applying to the goods. They used these colors some six weeks before they were taken sick.

One of these girls, Bridget C—, was in poor health for two or three weeks before applying for medical aid; appetite and strength failing, with torpidity of the liver, febrile symptoms soon supervened, and a scarlet rash appeared over the entire surface of the body, bearing a strong resemblance to Scarlatina. This diagnosis, however, was not entertained, after considering the other symptoms, and the assertion of the patient that she had had scarlatina before. This rash disappeared in two or three days, followed by some desquamation. Now followed what appeared like acute rheumatism of the right arm, particularly, the elbow, shoulder and wrist joints, and also of both feet and ankles; this gradually subsided, leaving the arm partially paralyzed until final recovery.

There was some inflamation and marked irritation of the mucous membrane of the stomach and bowels, evinced by the pain, or distress felt in those organs, and vomiting.

Treatment seemed to furnish but temporary relief; blisters over the stomach and bowels was more positively beneficial than any thing else.

After about two months illness this patient recovered, and has regained perfect health.

Margaret B— was employed in the same room, at the same business, with Bridget above named. Margaret's illness was not

quite as protracted, but there was a striking resemblance, in many respects, in the two cases. The rash, paralysis and rheumatism did not appear at all, the irritation of the mucous membrane was marked, but did not appear as early and it was accompanied with a good deal of biliary disturbance; this patient also gradually recovered her health.

There was no allusion to the use of these water colors, only by one of these persons, and that not until the sickness was well advanced. Drs. Dickinson of our place, and Russell of Hartford, saw one of these patients.

Once in possession of the knowledge of the use of the paints, suspicions were naturally aroused that these might be cases of chronic poisoning. But the symptoms so much resembled what we meet with in practice, and are not always able to trace to a cause, that no decisive opinion could be reached.

However, the rash so nearly resembled what has been described as eczema arsenicale, and the similarity of other symptoms to those described by writers on slow poisoning, such as exfoliation of the cuticle, paralysis and other nervous derangements, that it was thought the public might have an interest in investigating this subject a little further.

Accordingly, having procured the identical colors, I had them sent to Dr. Hayes of Boston, for analysis. He thought it hardly worth while to be at the trouble of an analysis, as the manufacturers of these colors could hardly afford to use the mineral colors in so cheap an article. However, he did analyze and the following is his communication.

29 *State Street, Boston.*

Dear Sir:—

I am much surprised at results of analysis of the water colors received from you.

The "light green" cake contains both arsenic and copper, the "dark green" cake contains copper, and the large cake of "Flake white," is principally carbonate of lead.

These soluble compounds of arsenic, copper, and lead are all very poisonous, and I think the party who makes and sells such paints should be imprisoned; as it is not generally known by those who use them, how dangerous they are.

Respectfully,

S. Dana Hayes, *State Assayer.*

24th March, 1869.

Boston, 24th March, 1869.

Results of analysis:—A sample of "light green" water color, received from J. J. Robinson, has been analyzed with the following results.

This single cake of green weighed 34 grains, and it contained 5⅗ grains of white arsenic, or arsenious acid.

S. Dana Hayes, *State Assayer.*

SUPERFINE AMERICAN MOIST WATER COLORS.

No. 18. A 1.

No. 18. A 1.

MANUFACTURED BY LEWIS HAEHNLEN,
PHILADELPHIA.
OSBORN'S FLAKE WHITE.

I would simply add that the substance of this paper, was presented to our county meeting, and it was then thought that if these facts were in possession of this Convention the public might in some way be benefited thereby.

ARTICLE XIX.

CASE OF PSEUDO-CYESIS.

BY ISAAC G. PORTER, M. D. OF NEW LONDON.

This term, pseudo-cyesis, will be recognized as applied by Simpson (after Dr. Good) to cases of spurious pregnancy. The case now to be detailed differs, in most respects, from those brought forward by the distinguished author named, inasmuch as the false appearances presented themselves in what seemed a case of twins —subsequent to the birth of the first child.

It stands alone in my experience; and not being described in such obstetrical authors as are within my reach, and as such cases may confound the young, if not the old practitioner, it is offered to the profession now present.

June 4, 1867. After an interval of fourteen years from the birth of the first child, the wife of — was this day delivered of a second. Her first labor was of long continuance (four days), being presided over by an irregular practitioner, and terminated in the last extremity, by myself with the forceps. Incontinence of urine continued for six weeks, but ceased without vesico-vaginal fistula. During her recovery she was feeble and hysterical; but the point chiefly interesting in the present connection is this, that her bowels during the month were uncommonly tumid, hard and brawny, as if the abdominal muscles were thick and rigid. On two occasions since, she has erroneously thought herself pregnant.

As labor advanced, she was anxious and nervous, fearing especially that twins were present, or that labor would, in some way, terminate disastrously. It was however normal, terminating in about twelve hours; umbilical cord pulseless and flaccid, and animation restored to the child with difficulty. Its weight was between seven and eight pounds. On applying the hand as usual to the abdomen, it was found as large as in many women at full time, the prominence reaching three inches above the umbilicus; firm and hard, especially in portions as large as the

shoulder or knee of a small fœtus. Pressure and friction were instituted, but with the effect of merely elongating the tumor, as if the circular fibres of the uterus contracted alone. Noticing her size and my manipulations, two women, who were in attendance and who had had children, placed their hand on the abdomen and immediately exclaimed: "She is surely going to have another." Nothing except the cord could be reached by an ordinary examination, a circumstance readily explainable on the unnaturally high position of the uterus as felt externally; and as there was no hæmorrhage, I resolved to await future development. I did so for more than an hour, every thing remaining quiescent, and the prominence and firmness *in statu quo*. At this time, slight contractile pains occurred and soon a small placenta presented itself. But this did not solve the doubt, for the question arose: May there not be another fœtus with its own placenta and membranes? thus accounting for the abnormal prominence and hardness.

Living in the immediate neighborhood of the patient, and not caring to subject her to the irritation of introducing the hand, for there was no flooding, and every thing except the enlargement being normal, I concluded to watch the case, and after the usual application of a bandage, waiting another hour, I left. At my next visit, I found the condition unchanged. Using vigorous friction, I had the satisfaction, however, of finding the nodules softening and less persistent, and the general size somewhat diminished. After tightening the bandage, I left, and on my return, six hours after, the abdomen, though large, was softer and the outlines of the uterus were discernable.

June 6. General condition favorable. Local symptoms, as last evening, pulse 108, skin moist, and patient takes light nourishment with pleasure, abdomen voluminous, but soft.

June 7. A tumor the size of a cocoanut is evident under the short ribs on the right side; also an unusual prominence in the hypogastric region—(sub-involution of the uterus or distended bladder?) soft, compressible, and tender on pressure. She passes water but sparingly, and yet there is no desire to urinate; bowels voluminous; pulse 98; milk is secreted; she is very nervous and apprehensive of evil awaiting her.

June 8. Tumor in right hypochondrium smaller, yet nodulic and firmer; bowels more prominent and tender on pressure; slightly tympanitic; passes but little water and pressure on the hypogastrium causes, for the first time, a desire to urinate. Bowels warm and

pulse nearly normal. Diuretics (Spts. Nitre Dulce, &c.,) ordered.

June 9. Abdomen tympanitic; urine sparing in quantity; tumor in right side diminishing. A full dose of ol. Ricini and ol. Terebinth caused the discharge of much flatus, which continued, as I was subsequently informed, for some days. The same means also resulted in a full and free discharge of urine, and the pulse and appetite being nearly natural, she passed from under my observation.

How shall the anomalies of this case be explained? Doubtless some present may have observed, after the birth of the child, a firm, rigid, board-like sensation of the the abdomen, a cramp-ce tonic, spasm of the recti-abdomen, and oblique muscles, which soon disperses on pressure and friction. But while such a condition of things usually continues but a few minutes, in this case it persisted for hours, conjoined as it was, with abnormal size of the abdomen.

It will be remembered that the patient possessed a strong, nervous temperament, and an impression that twins were present. My own belief is, that there existed a spastic contraction of the abdominal muscles, with tympanitis and ultimately, nervous retention of urine; symptoms, which would probably have vanished under the use of chloroform. This general condition yielded gradually, as the strength returned; the small tumor in the right side being mere wind or gas, temporarily retained within a portion of the intestines; the whole constituting one of those strange anomalies occasionally found, where there is a predominance of the nervous temperament.

Obviously, the only practical lesson which we can draw from cases like the present, is the use, which a knowledge of them imparts in the diagnosis of plural pregnancy. Such a case, if misunderstood, might puzzle a young practitioner, and lead to erroneous, if not dangerous practice.

MEMOIR OF

DR. GEORGE E. PALMER,

OF STONINGTON.

Read before the New London County Meeting, April 3, 1861.

BY ISAAC G. PORTER M. D., OF NEW LONDON.

As we once more assemble at this annual gathering of professional brethren, the absence of our genial countenance and stately form that greeted us at our last meeting, is painfully apparent. Without specification, you anticipate me as referring to Dr. GEORGE E. PALMER, of Stonington.

My acquaintance with him commenced at Yale College, in 1822, where for one year we sat almost side by side. He was then as since, the same in manner, taste and disposition; the identity illustrating the axiom of Wordsworth: "The boy is father of the man." In both relations there was the same cheerful and buoyant expression of countenance, as if the mind was ever occupied with some pleasantry, which sat ready to escape from his lips. How keen was his eye to a sense of the humorous; and he often found it in subjects that seemed scarcely to admit of it. Rarely did he make a speech, that did not embrace a jest before its close. However weighty his manner and expression at the outset, for he often spoke with great force and propriety, yet the lurking smile on his countenance and the twinkle of his eye, prepared his auditors for the sparkling wit, or the jovial humor which was sure, ere long, to present itself.

George E. Palmer was born in Stonington, April 15, 1803. Losing his father at an early age, his elder brothers, then successful merchants in New York, became his guardians, and had the superintendence of his education. While in college he maintained a highly respectable standing as a scholar, and his general warm-heartedness and correct deportment secured him a place in the affection of the wise and good. His prime motive for relinquishing the purpose of a liberal education, which he did, after a resi-

dence of one year, was the feeling that a classical course, while it did not actually unfit him for commercial pursuits upon which he designed to enter in connection with his brothers, yet was by no means necessary, and was delaying his entrance upon active life. A short trial, however, at the commercial emporium developed the fact, that his talents and taste, perhaps educed or at least cultivated by his residence in college, lay in a different direction. His nature was formed for society and literary pursuits, and, finding the bustle and activity of trade uncongenial, it rebelled against its narrow confines. A severe illness, at this period, led him to a solemn review of life, and its responsibilities and duties, and a thorough examination of his talents and fitness for usefulness. As the result, he commenced the study of Medicine in New York at the office of Prof. Mott, and graduating at the college of Physicians and Surgeons in 1825, he soon after entered upon the practice, in his native town. "And here," says the record of a friend, "for over forty years he went about among the people, ministering to the sick and suffering, cheering and lighting the pathway of those going down the banks of the dark river, and carrying help and comfort to the needy and afflicted, and, like the great Physician whose example he daily strove to follow, seeking constantly to do good." His enemies, for such unquestionably he had, will not deny the general truthfulness of these statements. In a pecuniary sense, it would have been better for his family, had he been less generous to friends, if not to the poor. To the latter, kindness and professional attendance and advice were never refused, however faint the prospect of pecuniary recompense.*

As we consider the details of his life and its different aspects and points of interest, let us speak first of his domestic relations. He was first married soon after his settlement, to Miss Emma Woodbridge of Stonington, May, 1826, who died in 1839. In 1842 he was again married to Miss Catherine J. McNeill of New York, who is now living. A number of children survive their father.

And in what connection may we more naturally allude to him as he was at home? Says a member of his family: "Who shall describe what he was to us? He spread a halo of gladness over his home, making it a place of perfect sunshine, charming all who came within its influence; himself living in the happiness which

* He bequeathed his library to the Medical Institution of Yale College.

he created. One of his most beautiful traits was his unfailing cheerfulness. However wearied and heavy laden with the burdens laid upon him, he never saddened those around him, even by a look; and though the cloud was often so dark as to obscure the way, he strove to dissipate it by the sun-light of his smile, itself the reflex of the perfect faith and trust which he borrowed anew, each day, at the throne of an all wise God."

Let us next view him as a magistrate. That his character and judgment were held in high estimation is shown by his having been elected for seventeen years, the chief magistrate of the borough in which he lived. In its meetings he presided with dignity and firmness, deciding many a question to the ultimate satisfaction of personal and political opponents. For several years, also, he was a member of the State Legislature, when his many, cheerful influence was often felt in enlivening debate on some dull and prosy matter of fact, and changing the indifference, or the frowns of the house into laughter.*

As a Free Mason he stood high and was widely known. I am informed that he had taken the thirty-third degree, and was for many years Master of Asylum Lodge at Stonington. Representatives from six lodges honored his memory at his funeral, which was unusually impressive, solemn, and imposing.

Having recorded the character and standing of the subject of this sketch, in the community where he was born and had lived, we are the better prepared to understand his position and influence, as a physician. The qualities which constitute the good citizen; the integrity, the sound judgment, the talents and good sense, which abound in the one, constitute the capital and the working power in the other, and when that power is exerted in the direction of medicine, we have the sagacious, astute, skillful and safe medical adviser. Such I suppose was Dr. Palmer's medical character. But in one respect he was privileged beyond the mass of his brethren. A physician's manner often mars or makes his fortune. In the instance before us, his cheerful and genial countenance, his kind and courteous bearing in the sick room, his politeness springing from the heart, his humorous conversation and anecdotes were, taken together, a fortune; making the patient forget himself for a while and inspiring confidence, as they do in protracted

* On one occasion, when the subject of final adjournment was before the house, he closed his remark by saying: "I particularly wish it, because, if I do not get home soon, I fear all my patients will get well."

diseases, or in soothing anxious forebodings for the future. In medicine, as in politics, he had decided convictions, which he was never loth to promulgate, or defend. Among the former was a strong tendency to conservatism, and the disuse of unnecessary medicine. He was never anything, in practice or profession, but an old school physician, and yet in a few families that had become tinctured, abroad, with homœopathy, he did occasionally and openly consult the tiny "chest and book" possessed by such families, but it was merely to amuse them with a placebo, in certain trifling, functional disorders devoid of danger. A physician in the same place writes me—"I have repeatedly heard him say that he had no faith in the system, and he certainly never omitted an opportunity to ridicule it and practice a joke at its expense. His was a genial, yielding nature which prompted him to try and please every one." As a placebo he may have preferred "dilutions and globules" in these cases, on the principle laid down by Andral: "if two medicines are held in equal estimation by the physician, that one is the best which the patient thinks is the best."

Having imperfectly portrayed his character in his relations to his fellow men, it remains to inquire what were his views relative to moral and religious subjects. At sixteen years of age he made a profession of religion in connection with the Congregational Church in Stonington, and subsequently, in 1844, he united with the Episcopal Church in the same town. Mainly through his efforts, as I am informed, the first Sunday School in the place was established; also a Saturday evening prayer meeting, of which he was a regular attendant, always taking a part in its exercises. A friend speaking of him says: "Many a soul now with him in glory, was first led to seek the pleasant paths of righteousness by listening to his earnest appeals, and his fervent and heart-felt prayers." The rector of his church says: "The religion of Dr. Palmer was a very cheerful one, and was as contagious as his smile; it was so utterly at variance with the long-faced sentimentalism known to many as religion. He did not say much about himself, but when he did speak, one was sure there was a deep principle of godliness within him. He had faults, and he alone of all others would hate undue praise; but they came from his natural, sanguine temperament. He was faithful, honest, true, and when he failed, he sought pardon and grace at the hands of a merciful Savior."

Lest it may appear that we have dealt mainly in encomiums,

let us inquire for a moment, respecting these faults to which his pastor refers. Living in another town, and knowing little of him in active life, I imagine that his strong points of character, his warm feelings and his impulsive, frank, outspoken disposition, led occasionally to satirical and offensive, if not harsh remarks, which in turn may have engendered heart-burnings and unkindness. Warm friends and bitter enemies would be the natural consequence. This is the more probable, from the fact that he was always much interested in politics, concerning which he had positive convictions of truth and duty—himself a leader among those who adopted similar views. Whatever their nature, or magnitude, none could lament them more than himself.

How may we more appropriately conclude this sketch than with the closing stanza of the most beautiful elegy in our language:

> "No further seek his merits to disclose,
> Or draw his frailties from their dread abode;
> (There they alike in trembling hope repose)
> The bosom of his Father and his God."

He died May 8, 1868, of fatty degeneration of the heart, with rupture of that organ, aged sixty-five years.

The history of the case is, in a medical sense, so interesting and instructive, that a mere outline, as an appendix, may be acceptable to the profession.

On the morning of his decease, which occurred at 9 P. M., he was in his usual health, except some gastric symptoms, including severe pain, but as these remitted he went out as usual on his rounds of practice. At 11 A. M. they returned with power, but soon so far ceased, that at 1 P. M. he took his dinner with relish and comfort. Soon after 2 P. M. the pains returned with violence, and now changing its seat to the chest, causing great oppression and dyspnœa. At this time Drs. Hyde and Stanton were called, and so evidently was the heart involved, that inquiry was made whether cardiac symptoms had ever existed; to which he replied, very positively in the negative; adding, "if I had ever had such, I should think this an attack of angina pectoris;" a disease which, doubtless, in some respects, it resembled. Not having room for detail, I can only add, that the agonizing symptoms alternated with intervals of ease, and during the latter he would give play to his pleasant humor, "the ruling passion strong

in death."* The physicians in attendance did all in their power for his relief, by administering powerful narcotics; but the effect was almost negatory. The stethoscope was not applied until one of the last paroxysms, too late to afford much specific intelligence. "The first sound of the heart was almost inaudible." He died about 9 P. M., having just before exhibited perfect consciousness.

There was no autopsy, but desiring the opinion of a specialist, in diseases of the heart, as to the probable cause of death, so far as it was possible to judge from symptoms alone, the case was referred to that eminent authority in medical science, Prof. Austin Flint of New York, who, without hesitation, ascribes the sudden death, to "fatty degeneration of the heart with rupture," a conclusion supported by reasons adduced by him, which we should be happy to present, had we room, and which are based on cases in his own experience.

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* The following colloquy is characteristic. On the arrival of Dr. Stanton, he inquired: "Did my family send for you?" "Yes, Doctor." "Well," said he, with a smile, "I doubt whether they would, if they had expected to pay the regular fee."

After one of his severe paroxysms, he said, "Gentlemen, these are what I should call efficient pains. How long do you think, before the child will be born?" After another and later, he said, "I think I must be on my last pins." These expressions, considering the circumstances and solemn event at hand, sound rather grim, and strike us unpleasantly; but they illustrate a strong natural principle, interwrought into his character and were almost as irrepressible as his breath.

MEDICAL COMMUNICATIONS.

ARTICLE XX.

SCIENCE AS A HELPER; INHERITANCE AS A HINDRANCE; DEATH AS A CONSERVATOR.

The Annual Address delivered before the Convention, May 25th, 1870.

By the President of the Society,

HENRY BIGELOW, M.D., OF NEW HAVEN.

Mr. President and Gentlemen, Members of the Medical Society:

MEDICINE as a *Science*, or scientific Medicine, has been steadily, or with slight interruptions, improving since the dawn of civilization, and during the present century has made rapid progress. Facts from many departments of inquiry have been collected and classified, nature has been interrogated by experiment, laws have been ascertained and principles settled. Hundreds or thousands of enthusiastic, tireless workers of every age and in different countries have devoted their strength and lives to the study. Whatever energy, patience and talent, aided by the best methods and fittest appliances, could accomplish, has been done.

Anatomy is a branch of medical science which has been prosecuted with complete success, and so far as it relates to the human subject little remains to be known. In the interesting department of Comparative Anatomy, however, without a knowledge of which the human form has little significance, there is yet work enough—enough certainly for the generations of this century and the next. In Microscopical Anatomy, which seeks to know the minute structure of organisms, wonderful conquests have been made, but still greater marvels may yet be disclosed. It is not easy to assign limits to that which human persistence, skillful

manipulation and improved instruments may accomplish in this particular field of inquiry. Nor has Physiology, the science of normal living actions, withheld its contributions to scientific medicine. Almost within my own memory, it has come out of the nebulous state, and from an unscientific beginning has already taken a high rank. Considered in its wider meaning and embracing Comparative Physiology, it is at this moment one of the most pregnant and hopeful of the sciences, giving or promising important aid in the solution of difficult problems. Of Botany, another of the so-called collateral sciences, embracing within its scope plants of priceless value in prescription, I need only speak as the chosen pursuit of many zealous and competent men whose labors have been crowned with distinguished success.

Pre-eminent among the medical sciences stands Chemistry. It has been cultivated with unintermitting assiduity, and a courage that has never faltered. The highest order of genius has been devoted to it, and extraordinary results have been obtained. It has contributed largely to scientific medicine, and imposed on the profession obligations which can neither be forgotten or discharged. Its power and utility have been displayed in the analysis of drugs, the isolation of their active principles, and the modification and improvement of the latter by combination. The discovery of the remarkable class of substances known as the alkaloids, of which that impatient and revolutionary agent, nitrogen, is the characteristic ingredient, is due to the chemists. A large proportion of our active remedies are now chemicals, the products of the laboratory. The copiousness and variety of our Materia Medica as compared with that of our fathers must be ascribed to our friends of the retort and test-tube.

Nor has Chemistry been content with these outer, material conquests. Adventurous, confident, sometimes audacious, it has essayed to explain the mysteries of the inner, organic world. Denying the existence of a distinctive vital principle; assuming the living form to be composed of chemical materials, built up, endowed and preserved by simple chemical force, and finally destroyed by chemical action, it has attempted to trace the steps and explain the cause of every movement. Nor have its promises been without a show of performance. In pursuance of a well defined purpose, its cultivators have, with unequaled diligence and a complete mastery of science, sought to know the composition, phenomena and laws of organized bodies. Remarkable

results have followed. The elementary constituents of organic matter have been exactly determined. The atomic constitution of several of its simpler compounds (those chiefly which are destitute of nitrogen and incapable of life) such as starch, sugar, fat, gum, has been clearly shown. By chemical agency, starch is easily converted into sugar, and urea and several other organic bodies formed from inorganic materials. That the difficult questions presented might be satisfactorily answered, all the substances, solids, fluids and gases, which are taken into the system as supplies, or which escape from it as detritus or refuse, have been analyzed and weighed, while the several changes wrought during the transit have been carefully noted. According to the liberal estimate of Professor Draper, a man of ordinary size receives annually, say, eight hundred pounds, avoirdupois, of dry food, eight hundred pounds of oxygen, and fifteen hundred pounds of water, in all more than a ton and a half; and if his weight be stationary, loses by the alimentary canal, kidneys, skin and lungs, in the form of non-assimilated matters, urea, carbonic acid and water, an equal amount. Every element taken from the world outside is restored to it. The organism can re-arrange atoms or molecules, decompose, recompose and rehabilitate compound bodies, but create nothing, destroy nothing. Note the facts.

A plant lives on inorganic matter—water, carbonic acid and ammonia chiefly—heat and light furnishing the extraneous force required. An animal receives into its body organic, highly elaborated, nutritive substances—substances surcharged with chemical force loosely combined and easily appropriated—converts them first into plastic material, then into living tissue, and lastly into lifeless, inorganic matter which, spent of its useful qualities, is cast off. By the last conversion, or during the descent from the organic to the inorganic state, a vast amount of "stored up force" is, as in the case of a falling body, liberated, metamorphosed and utilized. This, like that generated by the gravitating clock-weight or a bent spring, is employed to work the machinery of life. The force thus used manifests itself as muscular, or digestive, or hepatic, or nervous force, &c., or as heat, sensation, emotion, &c. How this change happens—how chemical affinity becomes vital power—we know not. Nor do we know how this same affinity is converted into heat and light by combustion, or into electricity by the galvanic apparatus. We understand, however, some of the conditions which are necessary. That oxygen plays an im-

portant part in all these processes is apparent. Oxygen is a powerful chemical agent, and the great instrument of change in the natural world, pulling down the forms which other agencies build up. It is taken into the system in enormous quantity, in weight equal to the dry food received, and diffused throughout all the tissues. The effect of so energetic a substance, let loose in such abundance among the reeking, unstable compounds of the body, must be in a high degree subversive in its action, unless controlled by vital power. Thus controlled—put in harness, as it were—it becomes not only an efficient worker, but an obedient, humble servant. Always at hand, it in some way, by permission, unites with the carbon contained in the food, the carbonic acid which appears in the expired air furnishing proof of the union. By this combination, heat, or its probable equivalent in other forces, is constantly evolved. The heat increases mobility, facilitates change and keeps the body warm; the other forces are mechanical and vital—muscular, digestive, cerebral, &c. "Whatever amount of power an organism expends in any shape is the correlate and equivalent of a power that was taken into it from without." [See Spencer's Principles of Biology.] It is contended that the carbon consumed undergoes a true combustion. The whole of the "stored up" force disengaged is just equal to that which is given out when an equal amount of carbon is "burned," whether within or without the body. According to the theory, this combustive process disintegrates and destroys portions of vital substance, solid or fluid; organic matter runs down; parts die and are rejected that the remaining whole may live. The explanation is ingenious and plausible in a high degree.

The vital structure is an apparatus so contrived and equipped as to convert inorganic or dead organic into living matter, physical into vital force. It effects this by means of an inherent, special endowment. This endowment is a force, *sui generis*, wholly distinct from those which govern inanimate matter—correlated with them if you please, but as distinct from them as they are from each other. Of its primal source we are wholly ignorant; but that it made its appearance subsequently to the material forces, geological facts well nigh prove. Unlike the latter, it is not necessary to the existence of matter. As we know it, this force always has its beginning in a pre-existing organism, but whether or not a creative act introduced it in the first instance, science does not inform us. In our experience, it is associated exclusively with an organ-

ized system, in connection with which it multiplies, develops and perpetuates itself. No known arrangement of material agencies, no artificial combination of appliances, has yet been able to evoke it; at least this is my belief. A living organism must be provided before the first or initial step can be taken. Generation does not originate but only continues existence. Chemistry has wrought marvels, but up to this time has not endowed with life a single particle of matter. I may be mistaken, but these are my convictions after having examined the facts. I do not claim that "spontaneous generation," so-called, is impossible, but that it has not been proved.

To say that vital force is nothing more than chemical force slightly disguised, as those chemists whose minds have been too exclusively occupied by their own science often do, is without warrant, and an abuse of language. With as much propriety might it be claimed that the force expended in the formation of a crystal is vital force. The two are easily distinguished. Each has its appointed sphere, and acts in its own way; each produces compounds and phenomena and groupings of the latter which are peculiar and specific. Nor do they exercise a divided sway. In its own proper field of action, each rules supreme so long as it rules at all. In the cases in which one disappears and the other is installed in its place, there is no union or blending, but a true metamorphosis and conversion. Why overlook all these and many other proofs of a diverse nature? Why contend that one does the work of both, or that the other has no existence? The proficient in Chemistry will not permit the physiologist to enter his laboratory, and to insist without protest that the force which there rules is not chemical, but vital—that the chemical principle, so-called, is a myth, or plays a secondary and subordinate part in every case, and that vitality acting under new conditions is the true cause of every phenomenon. Chemists who are jealous of their own rights should not claim for themselves what they are unwilling to yield to others.

Though the collateral sciences have sometimes suffered from misdirected labor, it cannot be denied that they have reared vast and solid structures of natural truth. In the matter of work, they have done their part, but has practical medicine been profited to the extent expected? Has the latter, as a general rule, been able to appropriate and utilize the important facts which have been placed within its reach? With all our new acquisitions, can we

prolong life, cut short disease, or restore health with any certainty? Are our methods of cure as much superior to those of our fathers as our science is more complete? Has the healing art kept pace with the other arts which owe their advanced position to modern discovery? To all these questions—I say it with sorrow, not with shame—a negative answer must be returned. Too often have we been unable to make our greater knowledge contribute in any considerable degree to our resources, or indeed to connect it with the ends for which we labor. Hence there is often a broad gulf between our science and our practice. Anatomy, Physiology, Microscopy, Chemistry, &c., do not qualify us to foretell without error the course of events in the interior of the system, especially when the natural actions have been suspended or perverted by disease. Not knowing what events may turn up, we can make no adequate provision against impending dangers. Often they come upon us suddenly and unexpectedly when no preparation was possible. The thick darkness which hangs over the future of us all no mortal eye, no human sagacity, has yet penetrated. Sometimes a man drops dead in the street when no one knew he was ill, and when the scalpel makes no important disclosure. Another sinks rapidly from a slight injury or surgical operation, or other seemingly insufficient cause. These accidents, so-called, or special providences, as many suppose, do not occur in the inorganic world. The physicist often knows as much of the future as the past. Foreseeing what will happen, he can anticipate and forestall events. The chemist will tell you distinctly how a familiar substance will behave when submitted to experiment—carbonate of lime for instance, when placed in dilute sulphuric acid. Consequently, he can provide without accident for whatever may come. Taking a bold stand, he can not only predict confidently, but bring prophecy to pass.

It is otherwise with the physician. He hesitates, and if he is wise speaks cautiously, trembling for results. However well he may know a family of children, he cannot tell how they will be affected by exposure to Scarlet fever, what course the disease will take, how opium, or calomel or capsicum may influence its progress, or what the sequels may be in each case. The same remedy, given apparently under the same circumstances, will not always produce the same effects. Embarrassed with doubt, he cannot prescribe without anxiety for severe sickness, not knowing what a day or an hour may bring forth. If prudent, he temporizes and

palliates till the sky clears up; waits for developments, watches symptoms and proceeds warily, feeling that his feet are on slippery ground. If he give medicine, his efforts are at first tentative. It is not till the disease assumes a regular type—till life returns to familiar channels, and the end can be seen—that his step becomes assured. Suppose in a critical case he pursue a bolder course, and attempt to arrest morbid action by strong practice. Whilst he waits with painful solicitude for suitable effects, straining his eyes to catch the faintest glimpse of a coming change, he cannot but notice that events come and go at their own sweet will, or are guided by a hand stronger than his. Dimly discerned behind the curtain, there sits a shrouded, unrelenting, mysterious power which resists his efforts and thwarts his aims. Against such odds, is it strange that the physician often gives up the contest, or seeks refuge in what is termed the expectant method—a method which follows hopefully and submissively instead of taking the lead and clearing a way for escape? It is certain that the practitioner can sometimes best serve the sick by curbing his impatience, and declining to interfere. Pursuing this course he gives his attention to minor points, and waits for new revelations, trusting for safety to movements which he does not fully comprehend, and which he can neither initiate or delay. I know not a more painful situation, or one better calculated to humble a proud, self-efficient man than that of the trusted medical adviser who, comprehending the danger, is obliged to sit by the bedside of sickness, the observed of all, without lifting a finger.

The limited influence of our art—its complete subordination to a higher law—is well illustrated by the uniformity which characterizes sickness and death. Not only do all men die, but each dies of some particular disease which we are taught to resist, and which the world thinks we ought to cure. The causes of mortality act with so much regularity that the rate of the latter may be precisely known. On the fact that out of a thousand persons of a given age, a certain number will die annually, in spite of the healing art, the system of life insurance is founded. That the risk may be accurately computed is proved by the practice of business men who issue life-policies at fixed prices, staking their dollars on the result. They do not find their calculations overturned by supposed improvements in medicine. Or, if we take a particular disease indigenous to a country, the deaths from it will be

found to bear a nearly uniform ratio to the deaths from all diseases. For Consumption, this ratio in Connecticut is about one to six and a third. But the death rate among a people does not seem to be dependent on any of the usual forms of sickness. Were Phthisis, Typhoid fever, Dysentery, Cholera infantum, &c., to become wholly extinct, I suppose that new disorders equally destructive to the same classes at nearly the same age would be introduced. A sweeping epidemic which proves fatal to large numbers is usually followed by unwonted health. It weeds out the vitally infirm, killing off those who would soon have perished from other causes. The decreased mortality which is the immediate result makes up for the previous increase, leaving the rate for the whole period unaffected.

It cannot be said that our insufficiency as physicians and frequent defeat are due to any lack of ability, or courage or persistence in the profession. We have had in our ranks our full proportion of eminent men—men of profound judgment and gifted intellect. Trained to their vocation, they are keen observers and cautious reasoners. No class of workers has surpassed them in industry, zeal and self-sacrifice. The phenomena of disease, its origin, history, characteristics, complications and results have been studied with determined resolution. Remedies have been sought the world over, and their properties and effects carefully examined; while skillful therapeutists have spent their lives in the endeavor to apply them to practice. Facts, so called, have been accumulated in bewildering profusion, and books written nearly enough to freight a planet.

All these things well considered lead to the conclusion that a wrong estimate has been put upon the difficulties of our art. These difficulties are extraordinary in kind and degree, and wholly different from those met with in the physical world. For them and their invincible character, our profession is not responsible. The nature of the obstacles which confront us at every step not only account for our short-comings, but vindicate us fully. Though often overmatched, considering the heavy load which has been placed upon us, we need not be ashamed. This conceded, let us no longer foster delusion, hoping for the impossible, but endeavor to ascertain what are the hindrances to the healing art—what their nature—what their causes and extent? What are the limits of our power to cure, and why are we thus limited? What is the law which interposes when more is attempted than can be accom-

plished? I may not be able to reply to all these questions, but I can answer some, and give reasons, perhaps for not answering others.

Leaving out of the account some of the simplest organisms, animal life in the individual begins with the fertilised ovum, or rather with the primitive or embryo-cell which the latter incloses. This cell, the product of two other cells called sexual, at first a mere speck of semi-fluid, albuminous matter, without discernable structure, has at the start but a single faculty, that of drawing to itself and appropriating nutritive matter, and the force required for transmutation, &c. By means of additions thus made, it contrives to gain in size and strength, or to grow. Simultaneously with this increase, and keeping pace with it, there is differentiation, the parts becoming unlike. To the eye, the first change is indicated by the "segmentation of the yolk." Then comes the "mulberry mass," then the "blastodermic membrane," then the "primitive trace," then the dim outline of central organs, and so on, the process up to a certain point being the same in all animals. The characters which distinguish the class, order, genus and species appear in regular succession. Always impelled by outside influences, the organism is forever in a state of transition, passing from one stage to another. Originally simple in form, homogeneous in structure, and indefinite in its characters, it becomes daily or hourly more complex, more heterogeneous, more definite. Out of the confusion, formed by continuous integration and transformation, the body of the young animal at length emerges. Organs, functions and faculties are unfolded and elaborated, one after another, till the work is complete. This proceeding from the general to the special, from a lower to a higher sphere, through successive differentiations, is called *Development* or *Evolution*. This continues till the prescribed limit of perfection has been reached, when a retrograde movement, not over the line of advancement but toward weakness and decay, commences. This downward plunge does not seem to be caused, as the chemists suppose, by the unresisted action of chemical forces. The end is reached through differentiations as regular and distinctive as those which marked the ascent, and wholly unlike anything which unassisted chemistry can produce. The organism during the whole period of its fall is active not passive. Nor does the body wear out as popular opinion supposes. If wear, so-called, is to be measured by waste, then the greater it is the more vigorous the functions, and vice versa. Life, in its normal

state, is in truth strong and active in proportion to the expenditure, and to a large extent in consequence of it. Properly speaking, there is no wear in the working of life's machinery, and consequently no loss by attrition. The duration of individual existence is determined by vital, not chemical or mechanical laws. Immediately, if I mistake not, it depends on the limitation which nature has imposed on the power of cell-multiplication by which repairs are effected and the tissues renovated. This power, renewed, rejuvenated and refreshed by the generative act, is always energetic till maturity is reached, when, at the very point of greatest perfection, and when decay seemed most remote, it begins to show weakness which gradually increases till cell-genesis and the life which depends on it becomes precarious and finally impossible.

That we may better understand the nature of development, I will go back to the facts which stand at the head of the developmental series. However a species may have originated, whether it began life as a single cell or as a more complex structure, this primitive organism, once in existence, would be acted on and modified—its equilibrium disturbed—by environing influences. Having, by the supposition, no hereditary bias, and restricted only by intrinsic causes and its own essential nature, it would of necessity be impelled in the direction given by these influences, or in the line, if you please, of least resistance. These outer agencies—air, light, heat, moisture, food, &c., acting singly or jointly would cause new molecular arrangements or inner change, and with change would come differentiation, the first step of development. A slight change in the environment (which is always varying) would cause further change in the organism. Thus the second step would be taken. Continued change would by the same rule produce continued differentiation, ending, under the guidance of the constructive principle, in complete development. In this manner the living form is pressed forward, and at the same time moulded and fashioned by external influences, its successive conditions or history representing and reflecting the latter. I shall not follow up this idea; but the effect of these reactionary movements and the developmental changes which follow is to bring life into greater harmony with the world outside. This harmony—in progressive races more complete in each succeeding generation—is made possible by the yielding, obsequious character of the indifferent organism. When the latter becomes unyielding—rigid, say, from age—or when its answering actions are irregular and spas-

stolic, as in disease, the power of adjustment is lost, harmony ceases, and death must soon follow. This correspondence between the organs and functions and surrounding agents, so conspicuous in nature, and so necessary to animal and vegetal existence, is what is called adaptation.

But that which is most nearly related to my present purpose is the fact that modifications of structure, peculiarities of form, and bodily qualities of whatever kind and however produced, reappear in the offspring. The first pair, having no inheritance, would bequeath only their united personal organization as it existed at the time of conception. The second generation, commencing life with an hereditary loss, would transmit this together with the modifications which personal causes had produced. The third and subsequent generations would follow the example of the second, each handing down whatever had been received, with the alterations and additions which itself had supplied. Thus an individual is in structure and function but the recapitulation of all that has gone before—an abridgement of his ancestry and of himself, that is, of his own history. Uniformity in the environment acting upon successive generations would insure uniformity of organization, giving characters common to the race, and permanent in proportion to their antiquity. During the long life of a species, embracing hundreds or thousands of centuries, these characters become, as it were, immutable. On the other hand, variableness in the outer world is the source of inconstancy in the latter. Inconstant characters are those which distinguish the varieties of a species or sub-species. As a general rule they have a feeble hold of the organism, have a recent origin, and are easily effaced. Fanciers take advantage of this fact when they would introduce a new breed.

Not only is the organization bequeathed, but the order of events and the time occupied by each of the several series are transmitted, the parental type being preserved. The family pattern, whatever it may be, is faithfully copied, and all its modifications successively adopted. In virtue of its inherited endowment, the embryo-cell runs a definite career, definite in its stages and duration, and definite in every one of its characteristics. In each step of its progress it is under constraint—hemmed in by limits, and bound down by forms which it cannot break over. Always starting from the same point, it is driven forward helplessly in the course marked out for it; undergoes all the changes and transformations peculiar to its kind, and does not fail to arrive at the different stages "on

time." An unseen influence guides it; a law which no scalpel or microscope or other appliance can reveal, presides over it. External violence or internal defects may cut short its course, but no cause consistent with healthy movement can materially change its direction or hinder its progress. Nor can the order fixed by heritage be reversed. Maturity is reached by innumerable successive differentiations, every one of which is made possible by some preceding differentiation.

Structure carries with it function, and all the qualities which appertain to a living organism. If the former be inherited so are the latter. Each of the organs and faculties exhibits the family likeness, follows in the footsteps of its predecessors, and acts as it has been accustomed to time out of mind, without much reference to present ownership. In truth, faculties are handed down entire and without a break from one generation to another. Though intermitting in activity, as in the sleeping and embryonic states, strictly speaking they never die. Appetites, propensities, instincts, aptitudes, tendencies, modes of thinking and habits of action, all live in the offspring. Not only are the prime facts of individual life determined by descent, but minor events, including those dependent proximately on the will, have to a large extent the same origin. Travelers speak of certain wild birds which, allowing themselves to be approached till experience has taught the danger, bear offspring which, untaught, fly away alarmed at the sight of man. According to the Westminster Review, referred to by Dr. Elam, a dog taught to beg bore a puppy which, though taken from its mother at six weeks, spontaneously took to begging at the end of seven or eight months. One day it was found before a rabbit hutch "begging" for the rabbits. The playful acts of the kitten are not those of the mother when grown up, but of the mother in its kittenhood, this fact proving that they are not imitative, but hereditary.

In essential points, one's history is written in the embryo-cell from which he springs. There will be found the causes of the good and evil which attend him. There are planted the seeds of disease and decay. If health and long life await him, there will be found the reasons for them. If the embryo-form be imperfect or poorly endowed, a sickly life and early death may be expected. In no event can the stream be purer than the fountain. I do not mean to say that a man's personal environment and his own spontaneity can have no effect on his destiny, but that he starts with

specific tendencies, a bias, a pressure in the rear which will usually control the result. If he begin life with broken machinery or a constitution fundamentally imperfect, the defects can never be repaired. In a case of this kind, development may be arrested at any time, slight accidents will produce extraordinary effects, certain functions will be discharged with difficulty, and fatal disease will appear prematurely, perhaps suddenly. Complaints which are not commonly hazardous, like Measles, Hooping cough, Mumps, &c., may prove mortal. If there be a particular family taint or tendency, tuberculous, cancerous, rheumatic, arthritic, maniacal, epileptic, apoplectic, calculous, &c., the appropriate symptoms will probably show themselves in due time, and at about the same age as in the parent.* Sometimes all the issue of the same pair will be cut off in infancy by hydrocephalus or convulsions, or soon after puberty by consumption.

Now here lie the difficulties which beset the physician. Nearly all the diseases he is called on to treat are, more or less, openly or otherwise, hereditary. Even those which are apparently due to personal causes owe their peculiar characteristics and perverseness to parentage. Death itself is a heritage. Not only that, but the time of its occurrence is fixed approximately by descent. With the most perfect organisation, and under the most favorable circumstances, a man loses his vigor at a certain age, grows more and more feeble, and dies when his original stock of vitality is exhausted. To appearance he is destroyed by some familiar complaint, but really by a cause which lies far deeper—a cause which has its roots in the remote past. He has run the career of his race; has reached the ancestral limit, and escapes by the avenue which is most convenient or accessible. If that had been closed, another would have been found. The particular disease is but the

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* For the unwelcome ills which come upon us, we are prone to look exclusively to outside influences—heat, cold, dampness, changes in the weather, errors of diet, poisons in the air, or in our food and drink, &c., and to forget the causes which are wrapped up in our own bodies. Because a chill or worse of chilliness marks the access of a large proportion of the maladies which afflict humanity, the mistaken masses and some poor physicians suppose that clean, cool, fresh air is the great enemy of the race, and that "colds," so-called, lay the foundations for most of our diseases. It is well to provide, as in most cases we may, for the substantial dangers which surround us, but not wise to mistake for them those very personal evils which are connected with a crippled organization—evils which are congenital and hereditary, against which no adequate provision can be made.

transient form which the departing life assumes, and to expect to cure it, however mild it may at first appear, is not reasonable. Medicine in such cases may not be useless, but strong drugs are out of place. Other disorders occurring in early or middle life, and due to hereditary faults, are often to be regarded more as evidence that our years have been numbered and will ere long expire, than as temporary perturbations to be removed. In these instances, were it possible in appearance to restore health, our patients would soon die of other and perverser maladies, and we might lose the credit won in precious illnesses. There are physicians in practice who, if their word must be taken, "never lost a case when called in season." They are knaves and quacks, and deserve our contempt as deceivers, no matter what their diplomas may say in Latin. All our patients, however adroitly managed, will die sooner or later, either under our treatment or that of others perhaps equally skillful. If given to vaunting, we may promise to cure every disease but the last. Further than this we cannot safely go; more than this our friends cannot reasonably ask. As our power to heal is limited, so is our power to slay. Men sick before their time will usually get well under almost any treatment, the worst included.

In one point of view, it may be considered fortunate that we know so little of the real significance of our infirmities—no more of the prescribed length of our days, and the connection which impending diseases have with our final doom. Perfect knowledge might extinguish hope so necessary to our comfort, discourage proper effort, and give rise to self-destroying despair. Much can be done by suitable medication to remove irritation, assuage pain, encourage sleep, and promote the general good, even when recovery is impossible. In all these cases, an intelligent, truthful physician is needed in the sick-room—needed to keep impostors out, if for nothing else.

Purposely in my preceding remarks have I omitted to notice certain apparent irregularities in the law of descents. Those permanent and essential characters which distinguish natural classes, orders, genera and species are transmitted infallibly and entire; but the fact is sometimes otherwise with the qualities which mark the variety. The latter are produced by temporary causes and, as already suggested, are unstable, superficial and uncertain. They make one individual to differ from another, and are personal in their nature. To this group belong all those bodily imperfections

and tendencies which may by any means be eliminated. In these personal and commonly transient peculiarities, one is more likely to resemble parents than grand-parents or remoter kindred, but the reverse is occasionally true, the result being determined by deflecting influences. A peculiar conformation or infirmity which has once appeared in a family, and which seemed forever lost, may reappear after a long interval. Thus a person may receive and transmit what he did not seemingly possess. Some of these cases of "reversion"—cases in which individuals resume ancestral types—are explained by supposing that the family mark, whatever it may be, remains latent till called forth by the exciting causes which are necessary to convert functional tendency into functional activity, or say predisposition into disease. In other instances, however, this explanation may not apply, as when a malformation or a supernumerary member is withheld from the children, but appears in the grand-children, &c. Irregularities of this and other kinds are doubtless connected with the fact that only one of the progenitors is, as a common thing, abnormally formed. The father may determine the organization of the first generation, the mother of the second, and *vice versa*, the result depending, often in an unknown way, on the foreign blood which marriage has introduced. However frequent these divergences from the usual order, and however difficult it may be to interpret them, the general law, in conformity to which organic peculiarities are transmitted, is not annulled. I have not room to say more on this interesting branch of my subject.

Though these alterations of structure and perversions of function growing out of our limited career, or which have been fixed in the organization by heritage, (producing diseases in their nature critical,) are beyond the reach of medicine; there are many disorders of a milder type, the result of recent, mostly personal causes, which are more tractable. These may be relieved by appropriate medical treatment,* aided by suitable regimen; but as a general rule, a permanent cure cannot be expected while the causes

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* Medicines are among the exciting influences which art may employ to modify and mold the functions, and counteract the effects of morbific agencies. Though incapable of subverting the movements determined by ancestry, and thus changing the destiny of the individual, though possessed of but half the power for good ascribed to them by professional enthusiasts, they are still sufficient for much useful work in their limited sphere.

are in operation. These causes, often social, sometimes endemic or climatic, are all those which act detrimentally on the individual, lowering the tone of the system, and contaminating the sources of vitality. Often they may be removed by changes in the environment —sometimes by the scavenger alone—and their effects counteracted by medicine. On the subject of Hygiene, the intelligent physician can speak with authority, and make his influence felt. He should take the lead in the great work of purification and reformation, strengthening the hands of the civil authorities, sewerage committees, temperance advocates and moral reformers.

Hereditary and constitutional vices—those which prevent the organism reaching maturity—run themselves out; and thus the race is preserved. In sick-room phrase, they act as a purge, and secure their own expulsion. If they are so flagrant as to destroy the individual before the marriageable age, transmission and perpetuity are of course impossible. If they be of a milder grade, and take life at a somewhat later period, fewer children are born, and these owing to congenital deficiencies will in most cases die before puberty. Sometimes, as in the case of idiots, imperfection is attended by infertility. Thus poisons of whatever kind, incompleteness and insufficiency of every degree are eliminated; not always in one or two generations, but ultimately. This process of self-purification, by which corrupt and corrupting elements are disintegrated and ejected, is forever going on. Were it otherwise, were infirmity and incompetency handed down with as much certainty as the opposite qualities, mankind would become hopelessly degenerate. To prevent this result, "nature," so-called, which is never sentimental, cuts off ruthlessly and casts out the worthless specimens, preserving only the soundest and best. This is what Mr. Darwin calls, not happily, "natural selection"—a doctrine which I have preached in my poor way, twenty-five years. "The survival of the fittest," as the general fact is succinctly described, not only preserves but tends to improve all living races. By the operation of this law, the "most favored individuals"—those whose circumstances and natural endowments give them an advantage in "the struggle for life"—are left in possession of the field, and would become the sole representatives of the species, were it not for the constant intrusion of debasing elements. Filthy habits, crowded tenements, hurtful occupations and practices, luxury and privation, intemperance and other excesses, acting upon each generation, are a perpetual drag on humanity, forever undoing the work of improvement and reform, and keeping the standard low.

In savage life, the conservative principle acts with more certainty and fewer hindrances than in the civilised state. The wild man is too poor in invention and resources to command many of the means of excess. Enervating luxuries and several of the social vices are unknown to him. His life is but a prolonged battle with hardships, a ceaseless struggle for existence, in which none but the toughest can prevail. Those not well qualified for this prospective warfare—the sickly, the weakly, the incompetent—perish in infancy, or are crushed out in the process of training. Only the strongest and ablest, the fleetest, most skilful and sagacious, those who can longest endure privation and exertion, and who are best able to contend with wild beasts and hostile tribes are likely to reach manhood and have children.

But in the civilized condition, heavier burdens are imposed on the conservative and eliminative process. A highly artificial society introduces many degrading elements and sundry new diseases. The poor suffer from overwork, unhealthy trades, want and exposure; the rich from indolence, overfeeding, anxiety about property and health, injurious practices and fashionable follies of every name; and all classes from ungoverned passions, drunkenness, licentiousness and a hundred vices. These causes, many of them peculiar to an advanced civilization, lay the foundation for disorders and calamities in great variety. Not only this, but persistent efforts are made to interfere with the work of deperation, and to keep the poison as long as possible in the social system. These efforts are prompted by the holiest instincts of our nature, but aim at a scarcely attainable object. Among the needy, the children of worthless or vicious parents die early, partly perhaps for the want of suitable care; but with the affluent, the same class may receive unwearied attention, the poorer the specimen the greater the diligence. The services of doctor, nurse, grandmothers and maiden aunts are secured. The maternal bosom, underlying perhaps a useless lacteal apparatus, is torn with forebodings of disaster. If the child survive the storms of baby-hood, new dangers loom up in the form of bumps, scratches, Hooping cough, Measles, Mumps, &c., and every footstep must be watched by hireling attendants. Those moderate vicissitudes and irregularities in the environment which excite temporary perturbations and healthful reactions, and which are indispensable to continued differentiation and complete development, are considered as enemies to be guarded against—guarded against on the false and mischievous plea that

the more regular the habits, and the more uniform the life, the greater is the chance of survival. The organism which cannot bear the alternations which are the conditions of growth is doomed to perish—the sooner, perhaps, for the means used to save it.

The marriage of an unsound to a sound person will not eradicate a constitutional evil, but only tend to diffuse and perpetuate it. If in such a case the better stock should have a preponderating influence, and children are born who in their turn have viable children, the mischief is for the time fixed. Without losing any of its qualities, it is divided among many descendants, and though concealed from view, it still exists in a latent state, and will, sooner or later, probably make its way to the light. In pairing there is, in the long run, as much lost on one side as gained on the other. Pairing alone can never remove corrupted blood, or change its essential characters, however much it may dilute it. Wherever this exists, there lurks a poison—a poison which must be expelled before safety is secured. Premature death is the natural remedy. I do not deny that there may be, in particular instances, some advantages from dilution. The contaminating elements may perhaps be so mollified and weakened by a large infusion of healthy material that favorable environing influences, inclusive of needful medical treatment, may at length cause their elimination without the loss of life. But such a result can only be attained by persistent good management, and a fortunate concurrence of circumstances. If the radically defective must marry, perhaps the wisest course would be to choose for partners those most like themselves, thus concentrating instead of spreading the evil. In this way a family would become extinct, but the race would prosper.

Children receiving a structure essentially faulty are exposed to danger at every step. Disease in a decided form is produced by causes apparently trivial; medicines do not give the customary relief; and death follows, perhaps when no good reason for it can be assigned. Some busy-body thinks it strange the doctor cannot cure so simple a complaint as Catarrhal fever, or sore throat, or "a cold in the bowels." Perhaps the prescriber thinks so too, but some good soul more charitable than either attributes the result to an "inscrutable Providence." The religious view is in accordance with the fundamental facts. Providence, whose ways are inscrutable to the afflicted, sacrifices a limited good that something better may be secured—kills off the individual that the race may live. Thus a great law, harsh in its execution but beneficent in

its results, is vindicated. Death on account of our fathers' guilt or misfortunes, death in any case, is a cruel remedy, but it is effectual, and should commend itself to those who are fond of the "heroic" in Medicine. It should be regarded not as a penalty, but as a means of salvation. Viewed in the broad light of humanity, the loss of a single immature life is of small account compared with the wide-spread evils which it might inflict—evils which could only be removed at a fearful cost. These reflections may not assuage the grief of bereaved friends, but science is satisfied when it has set forth the facts and declared the law. I suppose a very large majority of the deaths in infancy and childhood, particularly in the large cities, is due immediately to ineradicable vices of the constitution, hereditary and acquired, and remotely to an effort to remove from the social system unclean and destructive elements.

You see gentlemen where the current of thought has drifted us. You see the great cost of removing faults of organization by nature's method. In view of the facts, the question is here forced upon us whether the ends now imperfectly secured by means involving so frightful a "slaughter of the innocents" may not be attained in a better way. You will anticipate me when I answer: A better way is known, and only the consenting will is required to follow it. If a farmer be particular about his herds and flocks, he excludes from among them all the unsound and base-born. Would he improve their quality? He selects the best—the healthiest, the handsomest, the most intelligent, the more docile and teachable, &c., and breeds from these exclusively till the end is attained. Sometimes he sees up an ideal standard, and with this in his eye selects and rejects with the assurance of reaching it. If he buy an animal, he must know its pedigree. To allow a scurvy, ill-favored brute to mingle its impure blood with that of the elect would defeat his purpose and spoil his stock. Thus in a few generations he obtains superior varieties of horses, horned cattle, sheep, pigs and poultry, all of them vigorous. In the same manner, any particular organ or set of organs, any natural function, faculty or instinct may be developed. In this way, his horses become good travelers and his cows good milkers; his sheep bear fine fleeces, his pigs fat easily, and his hens produce eggs abundantly. Any slight variation in the form of the skeleton, shape of the head, length of the body or limbs, size and strength of certain muscles, &c., may be increased by successive small ac-

cumulations till it becomes a marked divergency, and a permanent variety is established. The initial change which is the first in the process of variation is often produced without special intention by exposing an organism to new conditions—a wild animal or plant, for example, to the influences of domestication. The wide departures from the natural standard which have already resulted from these influences aided by selection may be seen in the achievements of the dog-breeders, the pigeon-fanciers, the fruit-raisers, the flower-cultivists, &c. Under their management, the living structure is like clay in the hands of the potter. If there be limits to their power, (which I dare not deny,) no one knows what they are.

From our present point of view, man does not differ from the organisms below him, one law governing all. He has functions, of which nutrition is the chief, which are exclusively vegetative—common to him and plants. These are first unfolded, for a time make up his whole existence, and through life a large and essential part of it. He has other functions dependent on a nervous system which are as distinctly animal. They connect him intimately with all those living forms which give proofs of sensation and volition. It is not till life is somewhat advanced that he becomes anything more than an animal. The intellectual functions, the third class, make their appearance at a later period, and are usually considered as belonging to man alone, though the rudiments are plainly discernible in the lower animals.

The vegetal and animal functions do not look beyond the good of the individual. The life which they give is in large measure automatic and unconscious, having seemingly little intrinsic value. Nearly all the lower organisms and many of the higher appear to live not for themselves but for others, cotemporaries and successors. Many furnish food for those higher in the scale, while the remainder are mostly occupied in preparing and providing for offspring, in many cases dying as soon as this work is completed. Nature has little regard for individuals; sacrifices them without stint, but provides beyond contingency for the species. The function, distinct from all others, which preserves the race, carries it over from the present to the future, bridging the gulf, as it were, is the reproductive. It is common to all living beings, and secures its end by essentially the same means. Infallible instinct guides it; immutable law presides over it. Man, with all his nobility, is as much dependent on it as the humblest plant or animal, and is exempt from none of its conditions. Were it not for some goodly

inheritance it has already secured, and the almost unlimited improvement it makes possible, humanity might well despair.

"Our present civilization, whatever else may be said of it, is not what it should be. Though under the influence of the most distinguished appliances, some of them having been in operation for centuries, the average man has been but little improved. We have made great progress in science, theoretical and practical; have increased immensely our power over the natural world; have invented numerous labor-saving machines; have constructed steamboats, railroads and telegraphic cables; built great cities, sinks of vice; established colleges and free schools; made politicians and stump orators of our women; set the negro at liberty and put him in office; in many cases got rich in worldly goods, and spoken vauntingly of ourselves; but poverty, ignorance, degradation, pain, disease and rottenness of every name are still rampant. Old evils have sometimes disappeared, but new ones have taken their place. By the road we are now traveling, millennial perfection will never be reached. Our measures to reform the world do not go to the root of the difficulty. With much parade and diversified means, we try to purify the stream, but permit every one to cast "sewage" into the fountain. However thorough the cleansing may be, it must be repeated with every generation, and with very little gain. In this era of the world, in the last third of the nineteenth century, when all the facts are known, our practice should be reformed. The old methods of extirpating evil and improving the species having proved inadequate, suppose now we use a little practical wisdom, and apply the simple but effectual rules of the stock-raiser. While we provide prisons for the "dangerous classes," so called, and asylums for the unfortunate; while we take good care of our paupers, and protect ourselves from ruffians, burglars and nuisances, let us not forget that "like produces like," and that "an ounce of prevention is worth a pound of cure." I do not say that judicious selection and rejection would at once qualify all men and women for a more exalted sphere, and fit each for heaven. It is not easy to eradicate vices which are the growth of many centuries of savage and civilized life. But as a lover of my race, I would like to see the doctrine of human perfectibility—man's capacity for improvement—put to the test. That something may be done to lift him from the mire, and fit him for his proper position in the organic world, is certain. It is not to our credit that we are less anxious for the purity and health of our own lineage

than for that of the oft-times worthless brutes we are accustomed to rear. It is a shame that of all those who die in New Haven, more than one-half, on the average, are the cases of children under ten years, seven-eighths of the latter doubtless from avoidable causes. There is no sufficient reason—none that can be justified—why disease and death in early life should be so much more frequent in our own race than among our domestic animals that are well cared for. When we remember that the intellect and moral sense, the passions and instincts, vicious propensities, virtuous desires, degrading tastes, and whatever qualities distinguish individuals are seated in the organs, and that the organs within certain not narrow limits may be modified and molded, their vital condition changed, and their functional exercises controlled by intelligent, persistent breeding, and that those domestic influences which act so injuriously on the offspring—want and wretchedness in the family—will to a large extent be removed by the means which reform and improve parents, our indifference as to the fitness of those who perpetuate the race is not complimentary to our civilization.

The prevalent belief that the sexual faculty cannot be restrained or directed, that it must always be left to the guidance of a senseless instinct, that all with the necessary outfit, of whatever race or parentage, be they criminals, debauchees, natural cripples or other incurables, vagrants, scoundrels, or outcasts, have the right to representation in the next generation—the right to go about defiling the fountain of our dearest hopes, upsetting all our plans for improvement—is irrational, not to say monstrous. The thought of raging the authors of so much mischief must not now be entertained, for facts prove that the faculty in question will submit to checks. Public opinion does not permit marriage between persons too nearly allied by blood, or between young people whose bodies are not matured by age, partly on the ground that the children might be deformed, or puny and sickly. Popular sentiment in these cases imposes restrictions which are respected because reasonable and proper. I am not about to say what new prohibitions would be useful, or what additions to the statute already in existence should be made. Possibly the evils of which I complain and the remedy are outside the proper sphere of legislation. But a few years ago it was assumed that a government had a right to life, and might use any suitable means, whether within or without its moral sphere, to preserve it. Our national

life, or if you please our national welfare, is in greater peril from reckless breeding than it ever was from rebellion in arms. I am not certain that anything commensurate with the evils to be corrected or the good to be attained can be done, but our legislators and the sovereigns who elect them should know what are the facts. When all comprehend the situation fully, see plainly the terrible consequences which flow from present customs, we may find out whether a remedy be possible. A determined purpose, guided by wisdom, and modified by accumulating experience, may yet work out important results.

Faithfully have I endeavored to give a correct but very general view of the important topics which have come up for discussion. I have passed over much ground, selecting my path where the foundation seemed secure. For the most part I have avoided debatable questions. At almost every step thoughts were started which I was tempted to follow, but I would not be led aside. Out of the great variety and abundance of facts, I have had no little difficulty in selecting and grouping in an impressive way those best suited to my purpose. Sometimes, out of regard for feelings which I respect, or for prejudices which must be endured, I have spoken less plainly than I might. If, for any reason, I have not told the whole truth, I have said as much probably as will be borne now. Men do not like to be told of their inherited defects, and are not always patient when their right to assume the parental relation is questioned.

ARTICLE XXI

THE LIGATURE AS A HÆMOSTATIC.

Read before the Hartford County Society.

BY M. STORRS, M.D., OF HARTFORD.

HISTORY.—No mention is made of the ligature in the earlier writings of medicine. Viewed in the light of philosophy, the ligature marks an anatomical era in advance of that age; for Hippocrates and his followers had only confused ideas in regard to the arteries and veins, continually mistaking one for the other.

Two centuries later a distinction was made between these vessels, but it was supposed that the arteries contained air or carried a spiritual substance which was inhaled through the pulmonary vessels. Although there is a great advance made here in the physiological idea, so great that Erasistratus wanted but little of actually discovering the real circulation, yet the notion of a spiritual substance or essence flowing on through the artery, would not suggest the ligature for arterial hemorrhage.

In the succeeding age, in the later days of the Roman republic, when the anatomical period of antiquity had come to its full splendor—when the Alexandrian school of practical anatomy had gained a world wide reputation, Galen, the most distinguished light of the profession, maintained that the arteries carry blood, and when wounded, bleed. History records that the great man, who enunciated this anatomical truth, was the first to use the ligature.

But the centuries that follow—the dark ages, are unpropitious to anatomical pursuits,—the church is intolerant of dissections, anatomy is abandoned, surgery is divorced from medicine and falls into a decline, the ligature is forgotten. Bleeding wounds are barbarously treated by means of boiling pitch, melted lead, and the actual cautery.

In the beginning of the 16th century, anatomical investigations were revived. Vesalius and other distinguished names imparted new energy and life to their study. In the middle of this century the great military surgeon, Ambrose Paré, revived the use of the ligature. He gave it such a prominent place that he has been regarded as its discoverer. Through its use military surgery lost much of its terror; for the wounded and amputated limb was no longer plunged into the boiling oil or pitch.

But the ligature encountered great opposition in that period, partly from prejudice and jealousy, but more from the fact that surgeons had very imperfect notions as to nature's method of closing an open and bleeding artery. The discovery of Harvey in the 17th century threw much light on this subject, and lessened, to a great extent, the prevailing prejudice. But even in the middle of the 18th century we find writers obliged to advocate the use of the ligature. In the latter part of the century Hunter introduced his method of treating aneurism by the ligature, which gave a new impulse to its use. But Hunter failed to comprehend the full function of the ligature. He applied it loosely for fear of doing violence to the inner coats of the artery. Afterward this was admitted to be an important feature in the operation.

But the history of the ligature is not complete until we pass into the present century. Bell and Guthrie in the beginning gave us very important rules and precepts for its use, which are in force at the present time. In these more recent years the spirit of inquiry and investigation in regard to the ligature has been maintained, and to-day the ligature holds the first place as a hemostatic, with the great majority of surgeons.

Having thus glanced at the historic periods of the ligature, we proceed to the particular investigation of our subject, and what we shall say more or less in detail may be arranged in the following order:—

The mode of operation or function of the ligature.

The material for.

The operation for ligation.

The substitutes for the ligature.

But before entering upon the discussion of the ligature, and in fact before we could rightly consider any of the so-called hemostatic agents, made use of in surgical hemorrhage, it is necessary to observe the processes of nature in arresting traumatic bleeding. Whatever are the means we employ they must correspond in their elemental steps with those of nature.

1st.—We observe in the wounding or division of an artery, that the first effort of nature to arrest the bleeding, is by a contraction of the artery, and if possible, by a retraction also. The vessels of small or medium size, may be so effectually narrowed by this inherent contractile power as to have their flow arrested. In the larger vessels this contraction may not suffice, though the bleeding may be very much diminished.

2nd.—Following this contraction is the coagulation of the blood within and without the injured vessel. The liquid blood is thus converted into a fibrous mass, which within the vessel plugs the orifice, and without, re-inforces the contraction of the artery by bands of contracting fibrine. In arteries too large to be entirely obliterated by the first step, contraction, this second, the plugging with a clot, may suffice, especially if the sudden loss of blood should diminish the force of the circulation with or without syncope.

3rd.—In a few hours after the clot is formed, inflammation follows and the work of adhesion begins, so that the sides of the artery and the tissues around it, are more securely and permanently fastened together.

4th. *Reorganization.*—The preceding processes have been for the more immediate arrest of the hemorrhage. But the permanent arrest is not fully accomplished until the parts are reorganized. The serum and the coloring matter of the clot, as well as the clot itself, are finally absorbed, indurated and infiltrated tissues are relieved, dead and useless material is carried off by ulcerative absorption. Thus after the lapse of weeks, the recovery is complete. This, in brief, is nature's programme. We consider now—

I. The mode of Operation or function of the Ligature:

1st.—The ligature assists in the contraction of the artery. We might term it a mechanical appliance for the immediate and thorough contraction of the artery. This is true whether loosely applied so as to amount to a continued compression of the arterial coats, or more tightly so as to divide the inner and middle coat. In either case the ligature causes that contraction which nature in the larger arteries is unable to accomplish.

2nd. *Coagulation.*—Coagulation following the ligature is somewhat modified. The external coagulation is almost wanting, the blood being arrested by the ligature before it is caught in the arterial sheath and other tissues. The internal coagulum is more

perfectly formed with the ligature. These coagula, as in cases left to nature, furnish additional security. This is hardly required so long as the ligature remains on the artery, but in the event of an imperfect union the internal coagulum, having become more or less organized, is an element of greater security.

3d. *Adhesion.*—After ligation there is inflammation within and without the vessel. But the distinguishing feature under the ligature arises from the internal adhesion at once of the divided ends of the inner coats, which being completely severed by the ligature are yet held together by it, though not in contact with it.

4th. *Reorganization.*—It is in this period of repair that the chief objections are urged against the ligature, as follows:—

Delay in the healing of wounds.

Secondary hemorrhage.

Purulent absorption or pyæmia.

Delay in healing.—It is desirable to have a wound heal by what is called the first intention, provided that the parts are in a readiness to heal, and that the healing of a portion of the wound does not interfere with any other part, which must be left to suppuration and granulation. It is claimed that the ligature being a foreign body, cannot remain in a wound without adding to the irritation which ends in suppuration. It might be said in reply, that a ligature can be made of such material as to provoke little irritation. But, taking the common silk ligature, it is a question, whether it occasions any appreciable delay in the healing. It does not hinder the restorative changes going on in the artery itself. It is not in contact with the inner coat which is left undisturbed to unite. It is attached to that portion of the artery, the outer coat, that must undergo some change, being either removed by absorption or, as when the ligature is used, by ulceration; the latter may be the quicker process. As to the surrounding tissues, the ligature, by affording an outlet to the waste and useless material, may allow the larger part of the wound to heal at once. The ligature will ordinarily leave the small track occupied by itself long before the restoration in other parts is completed—before the nervous and vascular connections are established.

Secondary hemorrhage.—Bleeding now and then occurs when the ligature is leaving the artery. In a vicious state of the system bleeding will happen under any kind of treatment; there may be no tendency for the sides of the artery to adhere. But ordinarily, the portion of the artery which must ulcerate or slough

is the outer coat embraced in the ligature. The retracted inner coat is at a safe distance beyond this sloughing influence. When secondary hemorrhage occurs in a healthy subject, it is pretty generally owing to some fault in the manner of applying the ligature. The artery has been roughly handled, the vasa vasorum have been disturbed either by too much stretching or exposure of the artery. The accident may be compared to what follows in amputation, where a ring of bone will be thrown off because of injury carelessly done to the periosteum. We believe that there is nothing in the nature of the ligature rightly applied to cause secondary hemorrhage.

Pyæmia.—The notion that pus as pus is poisonous and is absorbed—purulent absorption—is now given up. Without entering upon the subject of pyæmia it is enough to state that in cases of pus-poisoning the hurtful element is not pus but some peculiar virus, liquid or gaseous, which is absorbed. The ligature only occasions the formation of pus; it does not render the pus unhealthy. If pus pent up with dead animal matter becomes so, then the ligature is a means of safety by affording a ready outlet for all hurtful elements, thus making purulent absorption less liable. The remedial use of the seton and issue shows that fear in regard to pus-poisoning from the ligature is groundless.

II. Material for the Ligature.

Much attention has been given to this point. Every kingdom in nature has been put under contribution. The ligature should have strength and flexibility, and at the same time must not be obnoxious to the living tissues. To meet these demands the following articles have been used:—Silver and iron wire from the metallic list, linen and hempen thread from the vegetable, buckskin, catgut, sinewy fibre and silk, from the animal.

It is claimed for the metallic ligature that there is a greater toleration of the living tissues for its presence than for the organic ligature. Foreign metallic bodies have been known to remain quietly for a long time, or during life, encysted in the tissues. For this reason a metallic ligature occasions less suppuration and ulceration, and in the opinion of some, there is less danger of suppurative poisoning, and the healing process is sooner accomplished.

The wire is applied to the artery, either to be left long, as in the case of the thread or silk ligature, or cut close upon the knot or twist. In the former case it is to be removed like other ligatures; in the latter it is to remain in the wound as a foreign body and to

become encysted. This cyst will contain for a time a small amount of pus and organic debris; for the ligature is not a quiescent body in relation to the artery, but exerts a forced pressure which will occasion suppuration and ulceration of the portion of the artery embraced. This is as certain to occur as the ulceration of the pedicle of a tumor constricted by the wire ligature. But the contents of the cyst will undergo the fatty degeneration and finally be absorbed.

The metallic ligature should have the preference to the organic, when it is necessary to avoid, as much as possible, suppuration; also when it is desirable to leave the ligature on the vessel, as may be the case in the large cavities.

The operation of the metallic ligature in all other respects is similar to the organic. It divides the inner coats, perhaps more readily, but the grasp is as fatal to the included external coat; though some maintain that the entire thickness of this coat is not divided or mortified, and that under the proper amount of pressure enough vascularity remains to insure the vitality of the artery in its free extremity beyond the ligature.

The objections to the wire ligature are, more difficulty in applying, danger of completely dividing the artery, of breaking the wire in making the required twists or turns, trouble in detaching when left long, and when short a kind of repugnance to leaving a foreign body to remain permanently.

For these and other reasons the wire ligature is not so much in use, and surgeons have shown their ingenuity in devising the wire and needle compression to gain the advantages and to be rid of the objections incident to the wire ligature.

In the organic vegetable class, linen thread is more in use. It makes a strong and flexible ligature but occasions more suppuration than other ligatures, and on this account is less used.

In the animal list, catgut, tendinous fibre and buckskin have been used under the belief that being organized animal structures they would occasion little irritation and in due time be absorbed. But some of these, when subjected to heat and moisture and to the absorbing influence around them, have been found wanting in strength, and others not absorbed have been found to act as dead animal matter.

In this class, silk, however, is the ligature in most general use. It is a peculiar animal substance, a gelatinous secretion of the silk larva, becoming strong, hard and flexible when exposed to the air.

But it is used as a ligature without any particular reference either to its animal origin or to the possibility of its absorption—though there is good reason for believing that in time it may be absorbed. The degree of suppuration which it excites is moderate, but enough for its ready elimination. The silk ligature is so common that anything more than to name it, is needless. Modified by antiseptics, making the antiseptic ligature, it has awakened some interest of late. Prof. Lister of the University of Glasgow, gives interesting experiments made with this modified ligature.* The thread is saturated with a strong solution of carbolic acid, which destroys all germs of decomposition in the material and is rid of the putrefactive and suppurative tendency of the common ligature. Such a ligature in results comes nearer to the metallic, yet unlike the latter, it may possibly be removed by absorption. Further experiments are needed to determine accurately the merits of the antiseptic ligature. It certainly would be good practice to subject the material, silk or linen, to the action of carbolic acid for the purpose of destroying all germs of decomposition, although afterward the acid might be washed out and the ligature allowed to be thrown off instead of being cut short and left for final absorption.

III. The Operation for Ligation.

The following points claim our attention:—

The Mode.
The Time.
The Place.

We shall make but a few suggestions as to the *mode* of operating. The rules laid down in our works of surgery are full and explicit, as to the manner both of approaching the artery and applying the ligature. But the ligation of an artery in the place of election, with no disturbance of the surrounding parts, is a comparatively easy thing, while to ligate the artery in *any part* of its course,—as will appear further on, there may be a necessity for doing, and that under the various possible conditions of the surrounding tissues,—is one of the most important and perhaps trying things that the surgeon has to undertake.

Incision.—These should generally be made in the direction of the artery, or in a line making but a slight angle to it. In so doing, we conform more to the direction of the muscles and the muscular fibres.

* Lancet, April, 1869.

Sometimes the incision is almost transverse to the artery, as in the case of the external iliac. And often in the case of wounds it may be more convenient to extend the division in the direction of the wound. The wound may involve two or more arteries and it may be impossible to determine which of the two are bleeding. The division of the intervening structure, if admissible, might bring us at once to the bleeding vessel. For example, a soldier before Richmond was shot through the upper and inner part of the thigh, the ball entering near the arch of the pubes, passing on between the tuberosity of the ischium and femur, emerged posteriorly. Violent hemorrhage from the anterior wound a week after the accident. Patient soon became pallid. It was impossible to determine the exact source of the bleeding. It was from some branch of the internal iliac, but whether from the gluteal, ischiatic or internal pudic or from some of their branches was uncertain. It was decided at once to cut down upon the ischiatic, but before the preparation was made the patient died. Subsequent examination showed that the blood came from an opening in the side of the internal pudic in its course up the ramus of the os pubis. The proposed ligation of the ischiatic would have resulted in failure; but a rapid transverse section of the intervening muscles would have revealed the bleeding point, and life might have been saved. In approaching an artery there is little work for the knife. The integument, fascia and perhaps the sheath of the larger arteries are to be divided. The finger or the handle of the knife find their way along through the tissues with less of hemorrhage and obscurity.

When the artery is reached it should be handled with great gentleness. Harm is often done by too freely exposing the artery or drawing its free extremity out with too much force—the vital connections are disturbed and the danger of sloughing is augmented.

When several ligatures are used, they are usually brought out at the most dependent part of the wound. A ligature may thus traverse the whole length of the wound and produce an unnecessary amount of irritation. They may also get entangled and the whole must remain until the last one is disengaged. It may be better to bring them out more separately, and it has been suggested that, when the artery is near the surface, the ligature might be carried, by means of the needle, directly through the integument. Sometimes the ligature gets embedded in the granulating mass,

They have been known to remain months and years. Generally, if the ligature is secured to a quill, for instance, and a turn given to it each day, it will soon be detached.

When to operate.—Sometimes this is a most difficult point to determine. Mr. Guthrie, admitted to be of the highest authority, says, "there is no precept more important than that which directs that no operation"—that is no ligation—"should be done on a wounded artery unless it bleeds, inasmuch as hemorrhage once arrested may not be renewed, in which case any operation must be unnecessary."*

In illustration of this precept, Mr. Guthrie gives the following example, which it is well to review.† "John Wilson, of the 23d Regiment, was wounded at the battle of Salamanca by a musket ball which entered immediately behind the trochanter major, passed downward, forward and inward, and came out on the inside of the anterior part of the thigh. The ball could not have injured the femoral artery although it might readily have divided some branch of the profunda." Several days after the receipt of the injury there was hemorrhage. "A tourniquet with a thick pad was placed as high as possible on the upper part of the thigh, and the officer on duty was requested to loosen it in the course of an hour; that was done and the bleeding did not recommence. The next day, the patient being laid on the operation table, I removed the coagula from both openings and tried to bring on the bleeding by pressure and by moving the limb; it would not, however, bleed. As there could be no other guide to the wounded artery, which was evidently a deep-seated one, I did not like to cut down into the thigh without it, and the man was replaced in bed and a loose precautionary tourniquet applied. At night the wound bled smartly again and the blood was evidently arterial. It was soon arrested by pressure. The next day I placed him on the operating table again, but the artery would not bleed. This occurred a third time with the same result. The bleedings were, however, now almost immediately suppressed whenever they took place, by the orderly who attended upon him; care having been taken to have a long thick pad always lying over the femoral artery from and below Poupart's ligament, upon which he made pressure with his hand for a short time. Absolute rest was enjoined. The hemorrhage at last ceased without further interference, and the man

* Commentaries on Surgery.

† Op. Cit. p. 219.

recovered." Mr. Guthrie adds that this case is a model one on which the treatment of all such injuries should be founded. Before remarking on this case we will give one which came under our own observation.

A soldier in front of Petersburg was brought into the hospital, a few days after receiving a gunshot wound of the thigh. The ball passed through laterally behind the femur at the junction of the lower with the middle third. He had the appearance of having already lost a large amount of blood. There was hemorrhage a few hours after his admission. The tourniquet being applied to the femoral, controlled the bleeding. Preparations were made to secure the wounded vessel. While administering the chloroform a medical officer from the field happened in. He at once recognized the patient as one who had bled several times at the hospital in the front. He stated that search had there been made for the artery, but as the bleeding had ceased the attempt was given up. This surgeon now advised the removal of the tourniquet and in case there was no hemorrhage a postponement of the operation. Removing the tourniquet no hemorrhage followed. A strict watch was put over the limb. Bleeding again at the end of three hours. Patient was now chloroformed and the divided femoral tied in the wound—the incision having been made in the line of the artery. Not much blood was lost in the operation, and indeed the quantity was small in the previous bleedings at this last hospital, but the patient died in forty-eight hours after the operation. The frequent small bleedings had so exhausted the man as to prevent his recovery.

These cases are very similar in their history—alike in the repeated bleedings, the reliance upon temporary means, the hope entertained that each successive hemorrhage would be the last, and in the preparations made for an operation. But they were unlike in their results. The first happened to recover without an operation, the other after an operation, terminated unfavorably. The fatal result is not to be ascribed to the operation, for on the whole it was not very severe, and, as has been stated, little blood was lost; but it was owing to the exhausted condition resulting from the repeated losses of blood.

In this case the precept of Mr. Guthrie was literally followed, and it is an illustration of the practical error into which any one guided by this rule may fall. And both cases well illustrate the difficulty in determining when to operate.

This precept should be added to the one given by Mr. Guthrie, never to allow a hemorrhage to repeat itself; when temporary means are not adequate, ligate. Promptness of decision saves the patient. Experience is invaluable in determining those cases which demand immediate action, and those which will admit of some delay. The size of the vessel must be taken into the account. If a large artery is wounded, delay is worse than useless. If a smaller one is involved, as in Mr. Guthrie's case, there was reason to believe, temporary means may control the bleeding. If the blood comes from the upper orifice of any artery above the middle size, operate at once. If the blood wells out from the lower orifice, pressure may restrain it as in venous hemorrhage. If the artery sloughs so as to leave an open aperture in the side of the artery, ligation must quickly follow. Such hemorrhages are the most dangerous, more to be feared than when the artery sloughs entirely off. In the latter there is some chance for the retraction, and, as a consequence, the contraction of the artery. A small artery with such an aperture may cause fatal syncope sooner than a larger one completely divided. The case of which mention has been made, where death was occasioned by a small opening in the side of the internal pudic is in point. To appreciate the importance of the precept never to allow a hemorrhage to return, we must better appreciate the danger from small and repeated losses of blood. The danger is insidious. A large bleeding which blanches the patient causes alarm, but the small bleeding has little perceptible effect. The pulse is quite good, and there is a fair show of strength in general. The absolute limit to which a person may go in safety does not seem to have been reached. While as a matter of fact for the long period of waste and repair that must follow, too little blood and strength remain. We say the patient dies of exhaustion; he dies actually of hemorrhage.

Surgeons should not be deterred from an early operation from any fear of the attending risk or difficulty. The violence inflicted in reaching any artery is small. The danger from this is not to be compared with the danger of further hemorrhage. And yet, we meet with those cases where the blood is almost gone, in which the slight shock of the operation would be fatal. We answer then the question raised, when to operate, by affirming, that we would apply the ligature in many of the conditions already enumerated, at once. We would operate in all cases, just as soon as temporary measures are shown to be inadequate to prevent a return of bleeding.

We come now to another important consideration in this division of our subject, viz:—

Where to operate.—The best authorities say, in the wound, at the place of bleeding; yet in practice many of these cases are treated by remote ligation. The teaching is right, the practice is wrong. Remote ligation should be the exception to the rule. The ligature applied on the Hunterian principle for aneurism forms no exception. The ligature in that case is applied for anticipated hemorrhage or for the cure of the disease. Should there be hemorrhage from the aneurismal tumor, the proper remedy does not lie in remote ligation, but in laying open the sac and applying the ligature above and below.

Remote ligation is inadmissible in primary and secondary hemorrhage from wounds, on account of the ample and wonderful provision made for the development of the collateral circulation. As physiologists we understand how quickly these new channels of communication are opened up everywhere and what an important end they subserve; but as surgeons we may forget our physiology. Take one or two striking examples. Should the arteria innominata on the right or the subclavian on the left be tied at the point where each leaves the arch of the aorta, blood would flow into the arm, of course feebly at first, by way of the intercostal branches of the thoracic aorta communicating with the internal mammary and superior intercostal branches of the subclavian, and so on through the regular arterial mechanism of the arm. Again should the abdominal aorta be ligated, blood would flow into the lower extremities by way of the internal mammary a branch of the subclavian, which inosculates with the epigastric, a branch of the external iliac. These extreme and remarkable instances furnish the proof that, any large artery being interrupted, as by a ligature, the blood will find its way to the parts nourished by that artery; that the collateral vessels already exist, and that in an emergency they are rapidly developed.

This physiological principle of inosculation in its relation to the wounded artery and to the nutrition of the parts, is a fundamental point to be considered in determining where to place the ligature. We observe that this collateral circulation is more rapidly established in a vigorous condition of the system, and when the interruption is more distal or remote. And on the other hand, it is retarded by an impaired condition, as from loss of blood, and when the obstruction of the artery is incomplete.

In applying a ligature upon the main artery of a limb, two points are to be considered. Will the parts below be nourished and will the hemorrhage permanently cease?

In regard to nutrition. If the hemorrhage is pathological or secondary in character, the danger of gangrene is lessened, as the new circulation has had more time for its development. But if the artery is wounded high up or is ligated in the same place for primary bleeding, below, the chance of nourishment is lessened. But experience has decided that in cases where the artery alone is involved that the attempt should be made to save the limb whether the upper or lower extremity. In the former the attempt will generally succeed. In the latter the chances of success are diminished. Although there is a striking provision made through the medium of the profunda, whose branches freely unite with the branches of the internal iliac above and with the branches of the popliteal below, yet a portion of the limb may become gangrenous, and amputation above the line of demarcation must follow. But a simple wound of the artery is rare. The problem is made more complex by the other tissues involved and by the general condition of the system. To apply the ligature in the wound is always carrying it to the most distal point possible, thus favoring the collateral circulation, and the nutrition of the limb.

Will the ligature above the wound permanently arrest the bleeding? We have observed that, by the normal and developed anastomosis, the blood will find its way into the artery below the obstruction. If the same changes had taken place in the lower orifice of the wounded artery as in the one above, there would be no recurrent hemorrhage; but the coagulum is loosely formed, and the adhesion is slight. As a result, the temporary plug is often washed out, and the blood flows from the lower orifice of the artery.

We can, therefore, only arrive at this conclusion, that, in respect to the nutrition of the limb and the permanent arrest of the bleeding, the only safe rule is to ligate both ends of the artery in the wound. This is the doctrine which good surgeons have inculcated during the present century, yet, as stated before, the rule is often violated in practice.

The following case furnishes a good illustration. In the battle of Roanoke Island, in the early part of the war, a private was wounded by a musket ball in the left thigh. The entrance of the ball was about six inches above the knee on the external side.

The direction of the ball as indicated by the probe was upward and inward. Ball was not extracted. Hemorrhage occurred a week after the injury. It was decided, in consultation, to tie the femoral just below the origin of the profunda. At the end of the second week, or one week from the ligation, there was hemorrhage again. After the second consultation it was decided to tie the external iliac. Hemorrhage in twelve days. It was now agreed upon to open the wound and secure the bleeding artery. This in fact was the only alternative. Blood was found coming from the lower orifice of the femoral. The ligature was applied to both orifices above and below, and the hemorrhage ceased. But the repeated losses of blood had so exhausted the patient that he lived but a short time—about forty-eight hours.

The points worthy of attention in this case are, that the first hemorrhage, in all probability, was direct from the upper orifice of the femoral. The ligature placed on that artery arrested the flow. The next bleeding, which occurred a week after, came from the lower orifice, blood having found its way through the lower branches of the profunda into the branches of the popliteal below and thus became recurrent. When the external iliac was tied, this more distal circulation was checked for a time, but was re-established when the upper branches of the profunda on the one side and the gluteal and ischiatic branches of the internal iliac on the other, had developed their communication. A fair inference from this developed circulation, so vigorously established, is, that had the last operation, tying the artery in the wound, been done in the first instance, the nutrition of the limb would have been secured, and unquestionably the life of the patient saved.

In a circular from the Surgeon General's Office, this statement is made:—"That during the earlier part of the war there were many surgeons who were not sufficiently impressed by the precepts of Bell and Guthrie, and who frequently treated secondary hemorrhage from gunshot wounds by tying the main trunk at a distance from the wound, even when the bleeding occurred at a comparatively early period. Later in the war, however, it was the universal practice to endeavor to secure both ends of the bleeding vessel at the seat of injury."* There was undoubtedly great improvement in respect to this particular point during the war; but according to our observation the practice was not universal.

* Circular No. VI, Surg. Gen. Office.

The following case, treated in one of the largest government hospitals, happened at the close of the war, after the evacuation of Richmond.

A sergeant was wounded by a minie-ball below the left clavicle and a little to the inside of the coracoid process. Hemorrhage in two weeks. Subclavian ligated—bleeding twelve days after. Patient died in a few hours from loss of blood. Post mortem showed that the axillary artery was wounded in the vicinity of the thoracic branches. Blood had come from the lower orifice. It had passed from the subclavian into the axillary through the supra-scapular and posterior scapular above, and the sub-scapular and superior thoracic below. The recurrent hemorrhage in this case is also good evidence that the arm would have been nourished and probably life saved had the axillary been secured in the wound.

If it is asked why there is such a tendency to depart in these cases from good common sense surgical practice, we shall find it due in a measure to the instruction usually given. Much is written and said and particular rules are given for reaching an artery; but the directions are for reaching the artery in a given place—the place of election, when all the parts are in a normal condition and the artery is easily approached. On the other hand, little is said in reference to searching for the artery in the more obscure and difficult places wherever it may be wounded, and there applying the ligature. It is oftentimes a difficult thing to do. The artery may be deep-seated—the surrounding parts are disarranged—the tissues are indurated and infiltrated—there is bleeding—the anatomical landmarks are gone. But the surgeon who has accustomed himself to find the artery in any part of its course in the normal condition, is gratified to find these apparently insuperable difficulties give way to his patient and self-possessed endeavors. Take for example a common occurrence in civil practice, a wound of the deep palmer arch. A surgeon of limited experience would tie the brachial artery, while the one of more experience would find the wounded artery in the palm. He would cautiously enlarge the wound if necessary. Should cessation of bleeding make its discovery difficult he will wait the return of blood. This course is the only safe and judicious one to pursue. In closing our remarks on this division of our subject, we repeat, that remote ligation should be the rarest exception to the rule of tying both ends of the artery in the wound.

IV. Substitutes for the Ligature.

We can hardly close this discussion without calling attention to one or two of the hemostatic agencies more recently introduced,—torsion and acupressure. Their consideration is forced upon us; for the advocates of each method are pressing their claims, and, according to their sanguine expectation, the ligature is to be supplanted.

Torsion.—Prof. Humphrey of Cambridge, says,* in substance, that the principle of torsion and the ligature is the same. That in both the inner brittle though strong coat is divided while the outer one, extremely tough, is compressed or twisted upon it. Indeed for several months, says he, I have used no other means but torsion for arresting hemorrhage, and it has answered perfectly in all the cases. There has been less pain after the operation, and the wounds have healed more quickly, with less suppuration, which the pressure of the ligature and the portions of tissue strangulated by it must occasion.

In Jan., 1869, in the same Journal he says—"I think, therefore, that in amputations and other operations, all vessels short of the size of the femoral artery as a general rule may and should be secured by torsion. The femoral artery may also be twisted with success. It was so, in the three instances that I have tried."

Dr. Gillespie,† surgeon to the Royal Infirmary, Edinburgh, says —"I have given this method of arresting hemorrhage a fair and ample trial, having as well as my colleague, Prof. Syme, trusted to twisting alone for occlusion of the femoral after amputation, with success. Mr. Bryant,‡ of Guy's Hospital, considers that torsion has decided advantage over the ligature and acupressure, upon physiological ground, and judging from experiments and practice, equally safe and judicious, and can be used in arteries of the first magnitude. Torsion was introduced in 1829 by Amussat. But in the hands of such men as Boyer, Dupuytren and others it was less satisfactory than with the modern advocates we have quoted.

The elemental processes of torsion and the ligature are very similar. But the temporary contraction of the ligature in the first stage is very much more powerful, and on this account better adapted to arteries of the first magnitude. Torsion, on the other hand, exciting less suppuration in the later stage of healing, is

* British Medical Journal, May, 1869.
† Edinburgh Medical Journal, Jan. 1869.
‡ Medico-Chirurgical Trans., Vol. 51, 1868.

more suitable for the greater number of smaller arteries in a wound. There are also special cases where we wish to be rid of the ligature, as for instance in the pedicle of the ovarian tumor.

We believe that the experience of the profession will discriminate in favor of the ligature for the larger, and torsion for the numerous smaller arteries. We must admit that the ligature in the hands of many has been abused. Some surgeons have a mania for tying every vessel whose size will admit of a ligature. We have seen in an open wound, as in amputation of the breast or limb, a dozen ligatures applied when in truth only one or none were absolutely needed.

Acupressure.—This method of arresting hemorrhage is of quite recent origin. Its advocates are strenuous in their claims. It was introduced by Prof. Simpson, of Edinburgh, in 1859. It was favorably received, but outside of Scotland has not been practiced to any great extent, and has not attracted until recently very general attention.

Prof. Simpson asks the question—"Could all the Hospitals of Great Britain, or of Europe, or of the world, if grouped and collected together furnish within the same period of three years as great number of cases of large operative wounds, where the ligature was employed, healed entirely by the first intention, and without the appearance of a single drop of pus, as the one little Hospital of Aberdeen!"* Dr. Wm. Pirrie, Prof. of Surgery in the University of Aberdeen, says,—"In every instance its use has been most satisfactory."† He says later, after extensive trial of it in important cases, "that I regard it as the greatest improvement of modern times in the treatment of incised wounds."

In an essay on acupressure by Dr. Peters,‡ attending surgeon, New York Hospital, read before the Medical Society of New York, twenty-three cases of acupressure are reported. Dr. Peters concludes "that the ligature does not close the caliber of an artery with more certainty nor more perfectly. It therefore seems to me to be proven that acupressure is the safer method, as by it we avoid that high degree of inflammation induced by the ligature advancing to the stages of ulceration, suppuration and mortification."

The principle of acupressure is somewhat different in its elements

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* Simpson's Pamphlet, p. 10.
† British Medical Journal, Aug. 1867.
‡ New York Medical Journal, June, 1869.

al processes from those of the ligature and torsion. It is more identical with that of compression. But the pressure is sharply defined—brought to a line upon the artery itself. By experiments this pressure is found to be sufficient to excite the adhesive process within the artery, without dividing the inner coats. Coagulation of the blood takes place, and the artery contracts. There are various ways of performing this operation which do not concern us now, but in all the cases the rule is, to remove the pin or needle in twenty-four or forty-eight hours.

The advocates of acupressure claim that all the drawbacks, which have been mentioned, as pertaining to the ligature, are avoided. We can only say that experience with this method is limited. It has failed to satisfy the expectation of many who have made trial of it. J. Cooper Forster, Esq., Assistant Surgeon, Guy's Hospital, says—"in reviewing the cases which have fallen under my notice, in no one instance has there been an entire absence from suppuration with such complete adhesion as I had been led to expect and hope for. I must confess here to a certain amount of disappointment."*

In the twenty-three cases reported by Dr. Peters, of N. Y., before cited, only one healed entirely by the first intention, and that was an operation for the removal of an adipose tumor from the outside of the thigh, one had secondary hemorrhage, nine terminated fatally, and one died of pyæmia.

Much remains to be ascertained in regard to this method. But there are many kinds of wounds in which it will be almost impossible to apply it. It cannot be used to any great extent on the field, the projecting needles would be incompatible with the rough handling and hurried transportation of the wounded. But further experience will determine its use and real value. Compared with the ligature we have no hesitation in saying that its application will be limited.

In conclusion, to resume. We have seen that the ligature is a natural hemostatic which is superseded by none for general use, and is indispensable for the larger arteries. We have illustrated the importance of early ligation before the repeated bleedings have exhausted the patient, and also the necessity of applying the ligature in the wound, and to both orifices. The comparatively new methods of torsion and acupressure are valuable agents for some kinds of hemorrhage, but they cannot by any possibility equal the ligature in its wide range of application.

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* Guy's Hospital Reports, Vol. 14, p. 192.

ARTICLE XXII.

SPECIALISM IN ITS RELATIONS TO PRACTICAL MEDICINE.

BY S. G. HUBBARD, M.D.,

Professor of Obstetrics and Diseases of Women and Children, in Yale College.

"Were it not better for a man, in a fair room, to set up one great light, than to go about with a rush-light into every dark corner?"—Bacon.

Within the last twenty or thirty years practical medicine in this country has made greater advance in all its departments, than in the two generations previous; in consequence, as I believe, of the superior quality and wider range of the medical education afforded, and the greater demands made upon medical men by a higher civilization—but mainly because of the assiduous cultivation of distinct sub-divisions of medical science, by men who, in greater numbers, have devoted themselves exclusively to the study of them.

The mature results of their labors, have been freely given to the profession in systematic treatises, monographs, and papers of less pretension, and as freely appropriated and assimilated by us, until they have become a very large and important portion of the common stock of professional knowledge. Nearly all the important improvements in operative surgery, the accepted methods of treating diseases of the eye and ear,—the skin, the kidneys,—diseases of the nervous system, and of the thoracic organs,—diseases of the male and female generative organs,—the best means of exploring cavities, and indeed nearly our entire knowledge of the structure and physiology of the organs themselves, we owe to the labors, often unrewarded, of a class of men, who, having devoted themselves to the study of a single department, or a sub-division of it, are properly called "*specialists*."

The *ideal specialist*, as he exists in the imaginations of some men, is a superficially educated person whose medical studies have

been limited to the narrow boundaries of a single organ, and who, knowing nothing of the laws of life, or of the influence which disease in one organ exercises over the functions of all the others, is incompetent to treat intelligently the local affections which he professes to understand.

It would seem to be unnecessary to assert in this presence, as I do, that a *specialist* of this ideal type, does not exist in the ranks of the profession in any civilized country. It is entirely a figment of the imagination. In a few instances, perhaps, the delusion may be honestly entertained and believed; but with the majority of men who declaim against specialism in medicine as a great and overshadowing evil, to be got rid of at any cost—and as such, having no claims on the respect of the profession, it is a mere stalking-horse behind which individual plans may be more effectually concealed, or it is a straw-image of their own creation, set up for the purpose of enjoying the cheap amusement of knocking it down. In a brief paper presented to this society in 1866 and published with the Proceedings of that year, the writer seems to view this subject from a peculiar standpoint; and assumes, what I believe has no foundation in fact, when he says more than once, and in varied phraseology, that the *specialist* is so narrowed in the scope of his intellectual vision, by treating much the diseases of one organ, that he takes no cognizance of the morbid condition of the general system, which may be either the effect or the cause of the organic disease which he is specially treating. And he adds, "Shall we deal then with the eye, or the lungs, as independent organs, bound by no laws except those regulating their peculiar functions? Yet, this is what the specialists propose."

As the writer is evidently in search of information, I will endeavor to answer his question, and show that specialists propose nothing of the kind; and moreover, that the highest interests of practical medicine require that the labors of specialists, from which general practitioners have derived all the knowledge they possess of the diseases of certain organs, should be continued; not only this, but that these labors should be fostered, encouraged and appreciated by the profession, as freely and openly as their results have been appropriated.

That they are already so appreciated by the leading minds in the profession, I am well aware; yet it is important that the unjust and groundless prejudice against specialists, which still exists, to some extent, among the mass of practitioners, wherever

may be responsible for it, should, if possible, be dissipated by a better understanding of their aims, as well as of the basis on which they rest their claims for full professional recognition.

We sometimes hear it alleged as an argument against the necessity for specialists, and even against the propriety of their existence, that some of the early fathers of medicine were able to master, and write intelligently upon, not only the various branches of medical science, but general science; and the fact that Hippocrates and Aristotle were able to discover and elucidate the laws of all science, to an extent that was remarkable even in that early period of the world's history, has been offered in proof of the assertion, that the medical mind of the present day is of an inferior order.

"When scientific phenomena were scarce, and scientific observers still more rare, when science had hardly any laws, doubts or contradictions, generalization was easy; and if, among such conditions, a highly intelligent mind sprang up, the difficulty would not be great of grasping, in one comprehensive mental view, all the divisions of the most extensive science, or indeed the entire horizon of existing knowledge."

"It was thus easy for Hippocrates to extract the essence of every branch of medicine, and even on some points of medical philosophy to write profoundly. And in the same manner, Aristotle became the very symbol of every science."

But observers increased in numbers, facts multiplied, and gradually as science extended, universal knowledge remained no longer the possession of a single individual. In medicine, which as a science is extraordinarily complex, and as an art, altogether indefinable, and hitherto uncertain, a similar evolution may be traced, and is still in progress. Step by step, as experimental induction advanced, and took the place of conjecture, definite diseases, brought to the test of analysis, were resolved into their constituent elements; and what was before regarded and treated as a single, distinct disease, a morbid entity, was divided into many, and served to concentrate upon themselves such a measure of attention and study as formerly would have sufficed for the whole nosology.

So that, even in Hippocrates' time, and still later, men made choice of special departments of medicine, and were recognized as specialists by the public, who believed that by concentrating their labors, these men were able to accomplish results which were practically beyond the reach of those great minds which could be satisfied with nothing less than universal knowledge, and mistakenly supposed they had acquired it.

By some of the most eminent men among medical teachers of our own time, the opinion is held that, owing to the wonderful progress of medical science in later years, and the rapidly extending boundaries of its domain, the curriculum of studies in medical colleges cannot properly be confined within four years of tuition; that at least *ten* years of hard study would be required for the student to attain a competent knowledge of all branches of medicine, in their present state of development. Whoever has for the last twenty years, or even less, attempted to acquaint himself with the daily growth of medical science, will readily concur in this opinion, and I think, will admit that, in his own efforts to keep himself abreast of the front line of scientific progress, he finds the work too much for him, and unconsciously or by compulsion, he ultimately confines his daily study to those branches of the profession which he is most frequently called upon to practice, or which his taste, or a just estimate of the situation leads him to select. In this way it is that men have become *specialists*.

Matured in mind, educated by years of self-culture, they bring to bear upon their chosen subject the full force of disciplined powers, and the accumulated wisdom of other fields, with an intensity of mental concentration, and sublimity of devotion, equaled only by the transcendent importance of their results. Every day, the general practitioner makes more or less use of these results without knowing to whom he is indebted, and often without spending a thought upon, or caring to know the immense cost of time, labor, money, health, and even of life itself, at which they have been produced.

I have said that Practical Medicine is indebted for its present advanced stage of development as a science, mainly to the labors of specialists. To this our minds must yield assent, whenever we glance at the books that fill our libraries, or follow out the train of reflection suggested by the sight of our standard authors. When we would examine the literature of any department, whether in book or periodical form, who would think of looking for reliable information except in the works of those who had in special clinics, devoted to it years of special observation and study?

Who can fail to remember that for our knowledge of the physical signs, diagnostic of the diseases of the lungs and heart, and for the invention of the *stethoscope*, we are indebted to Laennec—a specialist—who extended and improved upon the labors of Auenbragger, Corvisart and other specialists who had preceded him?

For the most approved treatment of the diseases of the throat by topical applications, we are indebted to an American specialist, Green; one of the earliest innovators in this country upon the old and indefinite methods of treatment of the diseases of special organs. As might have been anticipated, his brilliant discovery brought upon himself, as a specialist, an amount of envy, obloquy, and detraction, from the men of "broad views" and "comprehensive knowledge" in the profession, which is without a parallel in this country. Yet, he lived long enough to witness the substantial adoption of his views and practice, notwithstanding their early crudeness, by all men everywhere, who could recognize and appreciate scientific progress.

Starting from this point, and investigating the principles involved, Richardson and others have given us a still higher development of therapeutic science, in the treatment of diseases of the air passages by the atomization of medicated fluids.

The laryngoscope, for which we are indebted to another specialist—Czermak—enables us to diagnosticate and to cure diseases of the larynx and vocal chords, which had previously been beyond our knowledge, and thus beyond the reach of human skill.

Another specialist, Désormeaux,* has given us the endoscope, an important means of exploring cavities by direct vision, as yet but little known in this country, but which promises to be an instrument of great value.

In what a hopeless labyrinth of confusion and mortifying helplessness should we be, in our attempts to treat diseases of the kidneys, were it not for the labors of Bird, Beale, Roberts and other specialists?

Who among us is not familiar with the writings of Erasmus Wilson—an honored specialist, who has devoted a lifetime to the study of the diseases of the skin?

What should we know about the treatment of syphilis, that most loathsome scourge of the human race, were it not for the labors of specialists?

In ophthalmology, a branch of medicine now as much a science

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* Although to Désormeaux is generally credited the invention of the endoscope, he himself awards it to M. Segalas in 1826. But truth requires that it should be known that it was first invented by Bozzini of Frankfort in 1806; and that in 1824, Dr. J. B. Fisher, of Boston, devised and actually used an instrument identical in principle, and similar in construction with that at present recommended by Désormeaux.

in itself, as Astronomy or Mineralogy, almost *everything* that has given it character and definiteness, nearly all the most important recent additions to our knowledge of the physiology, pathology and therapeutics of the eye, has been accomplished by the observations and investigations of specialists. Much of that which is most valuable in it, and which has placed it almost on a level with the exact sciences, has been gained within comparatively a recent period, by the labors of men like Mackenzie of Edinburgh, Bowman and Critchett of London, Von Graefe, Arlt, Jager, Stellwag, and others of Germany, Donders of Utrecht—all specialists—not to mention the valuable contributions of American ophthalmologists.

Previous to the invention of the ophthalmoscope, the most important means of diagnosis ever given to the science, the pathological conditions of the deep structures of the eye had never been demonstrated on the living subject. Although this instrument was the invention of Helmholtz, a professor of physiology in the University of Heidelberg, and not a practitioner, it was applied to the study of disease, and its powers were fully developed by such specialists as Graefe, Jager, Liebreich and their coworkers, who have by its means contributed very much that is of the highest value, not to their own specialty only, but to general medicine, by teaching us how we may usefully apply it to the study of diseases of the general nervous system, and of the circulatory system, and even of the affections of the kidneys.

All who are familiar with Aural Surgery, and know much of its history, progress and present scientific status, will most freely acknowledge that nearly all that is of any value in it, is due to the labors of such specialists as Wilde of Dublin, Toynbee of London, Politzer, Gruber, Von Tröltsch, and many others of Germany, who have especially labored to relieve this department of the opprobrium which until a recent period has rested upon it.

It would be easy to extend our inquiries in this general direction to very great length, if it were necessary; but it must be too apparent to require further proof that, had it not been for the enlightened and honest labors of specialists, the claims of Medicine to be ranked among the sciences of the nineteenth century would be beneath contempt.

Without disparaging what has been done by specialists in other sciences, candor compels us to acknowledge a weight of obligation to medical specialists, which will remain undiminished by the lapse

of time, or the brilliancy of future discoveries. Specialism holds the same relation to definite progress in all other departments of science; and to its existence there we are also equally indebted. If illustrations of this fact were needed, we have only to turn to Chemistry and Physics. We should be ignorant of the constitution of the blood, and of course of its pathology, and therapeutic indications, but for this special branch of chemical and microscopic investigation. And we owe to the same source our knowledge of the constitution of the urine and other fluids of the body, both in their physiological and pathological relations. Our pharmacopœia could never have been enriched by the large class of alkaloids and resinoids, so indispensable to the modern physician, except through the labors of specialists; and to-day, the salts of Opium and Cinchona would be unknown to us, had not Serturner, or some other chemical specialist, examined the bitter principles of those substances. The same is true of Strychnine, Atropine, Aconitine and all the proximate principles of the crude drugs which formed the staple of the Materia Medica of the last century.

For the discovery of Chloroform, we must bear in grateful remembrance the independent labors of three chemical specialists; Guthrie of the United States, Soubeiran of France, and Liebig of Germany. And to the latter distinguished specialist we are also indebted for another no less remarkable and perhaps important medicinal agent, the Hydrate of Chloral, which, although discovered forty years ago, we have only recently appropriated to ourselves on the suggestion of Liebreich, another specialist of Berlin.

How much do we not owe to the labors of specialists, for our knowledge of Physiology and Physiological Chemistry, Botany and Toxicology? The results of these investigations in special departments of science, frequently extended through a life-time, have been freely given to the world, and have become an inseparable portion of medical science. In like manner, the discoveries of *medical* specialists, the inventions of new instruments and operations, new modes of treatment, with the development of new principles, which admit of a great variety of applications in other general and special departments, are all brought generously into the common stock, and laid at our feet as trophies from the domain of the unknown.

How do we receive these pioneer workers, as they come back to us, laden with treasures from the very frontiers of science? And what acknowledgement do we offer them, as we easily appropriate

to ourselves their invaluable additions to scientific knowledge—the very blood and brains of their lives? Do we point at them in derision, as visionary dreamers, characterized only by "narrowness;"—as "men of one idea," who spend their lives in the investigation of diseases which exist only in the imagination of the observer?

Every department of science that is successfully cultivated, has its specialties; and to this fact, in an eminent degree, is due the remarkable progress that has been made within the memory of most of us, in Chemistry, which has for its special departments, Chemistry applied to the arts, Commercial Chemistry, Analytical Mineral Chemistry, Analytical Organic Chemistry, and Organic Chemistry proper, with perhaps others. The numerous Astronomical observatories of the world, are in the care of observers who are well versed in all the sciences pertaining to their profession, and are capable of turning their attention to any investigations which are required. If they were all to give their attention alike to general astronomy, the accumulations of observations would be immense but comparatively limited to the ordinary phenomena of the heavens, while the progress of discovery would be very slow.

And so, recognizing it as a governing principle of practical life, as expressed in the maxim—"*Omnes non omnia possumus*"—"We cannot all do everything that has to be done in the world," these astronomers devote themselves to special work, special lines of investigation, and thus all are enabled to carry their researches far beyond what would be possible under the first named general plan; and thus have resulted the wonderful discoveries of the present century in relation to the constitution and laws of the heavenly bodies. Is Schwabe any the less an astronomer, because he has devoted more than forty years of his life to the investigation of the sun's spots? And because it was not until recently that his observations were utilized by others, and found to prove the periodicity of return of the spots, and led to still further discovery of the constitution of the sun, shall, therefore, the full meed of praise be denied him, as an eminent scientific explorer?

The same sub-division of labor exists, to a considerable extent, in the legal profession; and it is the position we see taken by many members of the bar, by distinguishing, every day more completely, between the civil and the criminal lawyer, the writers and students of commercial law, the law of patents and international law. The same sub-divisions, and consequently higher

results, are noticed among engineers, who devote themselves by preference to mechanics, architecture, hydraulics, rail-roads, or mining. But with these same distinctions, thoroughly practical as they are, shall any man say that the Chemist, who devotes himself to any of the specialties of his science, is therefore any the less a chemist? Tuckerman may give his life to the study of lichens, and Dewey to the grasses of America, and Michaux and Nuttall to our forest trees. Are they any the less botanists? Indeed, are they not more than others, by thus penetrating the inner circles of science, likely to make a nearer approach to the central thought and principle of a scientific classification?

Could it ever be conceived that an advocate, or a judge, who devoted himself to the trial of civil or criminal cases, would be for that reason less familiar with the entire science of jurisprudence? With still less reason could it be supposed that a physician should be less accomplished in his art, who understood more thoroughly than his neighbor, some specialty in medicine? And that, because he bestowed particular attention and study upon mental alienation, diseases of the eye, or of the skin, or upon diseases of women, he should no longer be recognised as a physician, in the fullest and highest sense of the word?

To affirm this, would be equivalent to denying the mutual dependence, every day more clearly revealed, of the various organs of which the human body is composed. And yet the idea, as applied to one branch of practical medicine, meets us at every turn; confronts us in strange company; and compels our attention by endless reiteration of the same stereotyped platitudes.

By a certain class of medical men, the term *specialist* is used as one of disparagement; and applied with that purpose to any who, by natural taste, peculiar circumstances, or a desire for higher professional culture, have been led to practice particularly in any one of the many departments of professional labor. It has even been assumed by the unwise and unthinking among them, that the study and practice of a *specialty* unfit a man for everything else; and that excellence in any special department is *prima facie* evidence of deficiency in all other departments of practical medicine. I say the unwise and unthinking, because it is difficult to believe that others could possibly be so unacquainted with the extent and exacting nature of the demands for comprehensive knowledge, which must be met by specialists, as to compare them to men who have "spent their lives in the rounding and polishing of needles," or to the incompetent "general, with armies to lead, can-

paigns to plan, and victories to win, who understands only the science of fortification"; and because no others would assume that the division of professional labor, by which, alone, practical medicine has been brought to its present elevated position as a science, leads to the same intellectual narrowness as does a minute division of labor when applied to cheapen production in the mechanic arts.

If one of you were suffering from a disease of the eye, which threatened the loss of vision, to whom would you instinctively turn for relief? To the general practitioner, who has spent his life in diversified labors, and whose very "comprehensive powers," and "broad views," have prevented him from acquiring any special knowledge whatever? Or would you seek the services of a professed surgeon and oculist?

If one of you were the subject of a tumor (possibly malignant), in a situation dangerous to life, you would apply to a surgeon for its removal; and if it were important to determine its exact pathological character, would you be likely to refer it to the general practitioner, who might be unable to distinguish between a cancer-cell and an air bubble, or to a pathologist, who makes microscopic study a *specialty*?

If your wife or daughter were the victim of any of those serious and insidious diseases which are peculiar to her sex, would you take for her the advice even of the most eminent general practitioner in your vicinity, or that of some one whose special studies and practice had better qualified him to treat her case successfully?

Of course, if these supposed contingencies should ever become, to any of you, matters of actual personal experience, your practical answers to these interrogatories would be in every instance the same. You would each choose for yourselves, or your dearest friends, the opinion and treatment of a qualified specialist, or of some one who is constantly seeing and treating cases of the kind. How does it happen then, I ask, that we so frequently see in our periodical literature, even in Reports to the American Medical Association, and hear spoken, the language of innuendo and detraction, as applied to men who devote particular attention to special classes of disease? In some instances it may be accounted for, on the supposition of a want of general professional knowledge, without which there cannot be an honest disbelief in the existence of the special diseases treated. In other instances it can only be accounted for on a supposition which I prefer not to mention, and would not willingly entertain. Whatever may be the real reason,

there can be offered for such a course no apology which is not at the same time the condemnation of those who indulge in it.

Let us pause for a moment, and inquire who are the men against whom this storm of dust and wind is raised? What is their standing at home and abroad? Are they found among the inert mass, or even among the average members of the profession? Are they violators of the Code of Ethics, or regardless of the honor and the dignity of the profession, more than others? Do they, more than others, give themselves to extra-professional pursuits? Do they from entire loss of interest in medical practice, or for other reasons, prostitute their professional characters to the level of a trade, and sell their wares in open market to the highest bidder? Have they so conducted as to forfeit the respect of the public, professional or otherwise?

Let the opponents of "Specialism" make out their catalogue of offenders, that we may learn their numbers, their standing as physicians and as men, and become acquainted with their personal history, and principles of action; and if they are found to have injured the profession, or degraded themselves below an average rank in it, sustaining no other relation to it than as barnacles on a ship's bottom at the close of a voyage, it will then not be too late to denounce them and visit them with penalties. But until this is done, is it too much to hope that this puerile clamor and declamation will cease?

But to return to the examination of the paper to which early allusion was made, let us see if there be even a grain of truth in its assumptions. The writer says:—"The tendency of local prac-"tice is to magnify the importance of local disorders, and of local "remedies. In evidence of this, we need only refer to that nu-"merous class of uterine disturbances, a class of troubles from "which the females of a former age were happily exempt. Here, "as elsewhere, narrowness leads to errors of diagnosis. With all "the light that the speculum has shed upon this inviting and "thoroughly explored field, not a tithe of the diseases claimed to "be there discoverable, do exist, other than in the eye of the "observer."

Such reasoning is incompatible with any adequate acquaintance with the writings of specialists, as such,—or with the profundity of knowledge in general science and literature, combined with the widest and most critical knowledge in every department of practical medicine, which some of these "men of one idea" have shown themselves to possess.

Can Sir James Simpson be accused of "*narrowness*" because for more than thirty years the best energies of his mind, stored as it was with vast treasures of medical lore, both ancient and modern, were devoted to the alleviation and cure of the diseases of women? Can we find any evidences of "*narrowness*" in his many and valuable contributions to practical therapeutics,—in his writings on public hygiene,—in his researches in archæological science,—in his work on Acupressure,—in his very voluminous Obstetric Memoirs, or in his investigations of the action of new remedies? And lastly, is there any evidence of "*narrowness*" in that remarkable series of experiments with anæsthetics, which have culminated in the greatest discovery of the age, and conferred upon suffering humanity (especially on women) that priceless boon, "the thrice blessed chloroform"?

Yet he was pre-eminently a *specialist*, and as such, received the honor of knighthood; bestowed solely as a public acknowledgment of the distinguished services that he had rendered to science and to humanity, but which can add nothing to the lustre of a name so gratefully cherished in every portion of the civilized world.

Examine critically the writings of any other specialist—of Churchill, West, Spencer Wells, Wilson, Beale, Roberts; of Matthews Duncan, Keith, Graily Hewitt, Bowman and McClintock; of Byford, Emmet and Peaslee; Sims, Thomas and Storer, with scores of others whom I might name, and if you detect in them evidences of "*narrowness*," I beg to inquire by what standard have they been measured?

Narrowness of mind is confined to no class of men; nor is it the peculiar result of any form of intellectual labor. It is peculiar to the individual, and is more or less pronounced in proportion as the man is more or less educated, or more or less highly endowed with natural gifts. Intellectual powers, while they are capable of increase by cultivation, are also in so great a measure due to inheritance, that the most laborious efforts are in many cases insufficient to enlarge the mental horizon beyond the narrowest limits. Such minds are congenitally narrow; and whatever their surroundings, or the advantages enjoyed, or in whatever calling they are found, "narrowness" is their most distinguishing characteristic.

If artizans, they may spend their lives in the "rounding and polishing of needles." If physicians, they have the most limited knowledge of the general principles which underlie the science and art of medicine, and still less acquaintance with the isolated

facts and discoveries of those patient, self-denying workers in all the special departments of knowledge, the aggregation of whose labors forms the very foundation of all science, and the materials from which, by wise generalization, the great principles of practical medicine have been gradually evolved. What evidence is there to suppose, as this writer declares, "that the females of a former age were happily exempt" from diseases of the uterus?

Let us see. The causes of the diseases peculiar to women are of infinite variety. Some of them have been in operation ever since the fall of our first parents, and are still active through the functions of menstruation and child-bearing, of course with increased force and frequency, as the race has progressed in civilization, and in the cultivation of æsthetic tastes. There are still other causes, incidental to the more artificial and unnatural style of female education, and modes of life common to modern society. So that, in addition to those which have been in operation from the beginning, and which, being inherent in nature, must always continue, we have a still larger class of causes now in operation, and to the preponderance of which must be referred, if it exists, the greater frequency of uterine diseases now than formerly.

Four hundred years before the Christian era, Hippocrates wrote largely on this subject, and his writings, as well as those of Galen and Aretæus who came after him, and all of whom practiced in Rome, afford positive evidence that there existed at this early period a very advanced state of knowledge of the diseases of women. For example, the writings of Galen contain the earliest allusion to the vaginal speculum, while Aretæus describes "ulceration of the womb," with a precision that leaves no room for doubt that he also employed this instrument as a means of diagnosis.

But the vaginal speculum has, perchance, even an earlier history than this, for a three-bladed instrument of the kind has been exhumed in the excavations of Pompeii and Herculaneum!—Cities founded in the time of unknown antiquity, but destroyed, as we all know, in the reign of Titus, A. D. 79. With the writings of Hippocrates, began the literature of medicine in this department; and if we may judge from his voluminous writings upon the subject, uterine diseases must have been very common in his day. To diseases of women alone, he devoted three volumes, in which he discussed Metritis, Induration, Fibroid Tumors, Menstrual Disorders, and Uterine Displacements. Then, as now, the knowledge of these special diseases was not in the possession of the entire

profession; for, so limited had been the diffusion of knowledge, that more than four hundred years afterward, physicians generally were ignorant of what had been already known. Witness the New Testament narrative of the "woman which had an issue of blood *twelve years*, and had suffered many things of many physicians, and had spent all that she had, and was nothing bettered, but rather grew worse." Either the faculty were ignorant of the treatment of uterine hemorrhage, or refused to attend after the patient's money was exhausted, or perhaps they were afraid of incurring the charge of "*curiousness*" by attempting to remove the polypus from which the woman had so long and so terribly suffered. Besides the authors already mentioned, Archigenes and Celsus, who probably lived in the second century, also wrote on the diseases of women. The first, accurately described the "vaginal touch," the varieties of leucorrhœa and ulceration of the womb;—while the the last, gives an excellent description of pelvic-cellulitis.

For centuries afterward the study of the diseases of women was pursued with great vigor, but unfortunately for us, many of the writings of the authors of that period are destroyed or in fragments, so that now, reference is almost exclusively made to the compilation by Actius, showing the state of medical science in his own times, and an abstract of the existing writings of men who had preceded him. In describing his own practice, as well as that of his contemporaries and predecessors, he treats of the diseases of women in such a way as to render it certain, that he had a thorough knowledge of many of them; also of many of the means of investigation and treatment which are in use at the present day, and which have in many instances been regarded by us as new; and very properly so, inasmuch as they have been rediscovered more than thirteen hundred years afterward. This industrious compiler devoted 112 chapters of his 16th Book, to diseases of women. Thirty-seven of these treat of pregnancy, parturition and suckling. There are six chapters on "Ulcers of the Uterus," three on Abscesses, two on "Displacements," two on "Obstructed and Imperforate Uterus," seven on growths occuring in the vagina and uterus, and eighteen on menstruation and its disorders.

If further evidence is needed to show the excessive "*curiousness*" of the fathers, and that they described diseases which existed only "in the imagination of the observer," I will add that Actius particularly described nearly every disease of the uterus that is

recognized by the best observers of modern times; and the treatment he advises, includes most of our modern appliances, with frequent mention of the use of the speculum. His directions for the preparation and use of sponge tents are almost identical with those commonly followed to-day; and he clearly sets forth the uses of medicated pessaries, for which he gives more than a hundred formulæ; the use of vaginal injections; caustics for ulceration of the cervix; dilatation of the cervix by tin tubes; the treatment of inflammation of the various tissues and appendages of the uterus; and lastly of the modern uterine sound.*

I have repeatedly inquired of the wives of our Foreign Missionaries whether the native women are exempt from uterine diseases, and in all cases they have assured me that the native women do suffer from a considerable variety of uterine affections, for which they are treated by native physicians by sorcery and otherwise. I could quote from the historical literature of this special department, at still greater length if it were desirable; but I think I have satisfactorily disproved the charge that uterine diseases are a modern invention, "from which the females of a former age were happily exempt"; and which are limited in number only by "the imagination of the observer"; and that any degree of excellence in a special department of medical practice is followed as a necessary sequence by "narrowness" of mind. Moreover, is it not clear, from what has been said, that we actually owe to "specialism" not only all the definite, permanent progress which the science of medicine has hitherto made and is now making, but that the rate of progress and discovery in every department of scientific knowledge, depends on the numbers and faithfulness of the "specialists" who cultivate them?

It is charged that "the tendency of local practice is to magnify the importance of local disorders, and of local remedies;" and the special treatment of uterine diseases is cited as conclusive proof of this. As the treatment of diseases of females is thus made the scape-goat for all the imaginary sins and evils of special practice; and is held up as a typical example of the disastrous effects of specialism in medicine, thus revealing more clearly the purpose of

* I am indebted for the historical data of the subject, to papers in the Dublin Quarterly Journal by Dr. Wright,—also to the Medico-Chirurgical Review, and other modern sources of information.

the writer, I have confined my remarks more particularly to that branch of the subject. For, although I am not myself a *specialist*, in the strict sense of the term, being largely engaged in general practice as well, my daily treatment of this class of diseases permits me to speak of them from personal knowledge; and I believe that an experience derived from the special treatment of many hundreds of cases of uterine disease, and a general practice of nearly thirty years combined, qualifies me to express an unbiased opinion, not only as to the merits of the special department to which I attend, but also, as to the value and relations of "specialism" as an element of substantial progress in medical science.

And I wish distinctly to say here, that I disclaim all desire or intention of being personal in my remarks in any direction. I am combatting and criticising *opinions*, not persons; and I desire particularly to dislodge from your minds what I believe to be an error, and to substitute for it what I know from ample experience to be the truth.

To any one who is practically familiar with uterine pathology and therapeutics, and to the best informed among those who are not, it may appear almost an unnecessary labor to controvert such statements. For every one knows that, to attempt to treat a serious disease of one organ, without giving particular attention also to the condition of all the others, especially to those with which the suffering organ is in most intimate relations and sympathy, would be as unsuccessful as it is unphilosophical. To such a mind, nothing can be more illogical—than to say that, the special treatment of uterine diseases tends to magnify unduly the importance of this organ and its diseases to the female economy. For the sympathies of the uterus with every other part of the female organism are so evident, and the sympathetic relations of all the organs of woman with the uterus are so numerous and complicated—so intimate and often so distant, yet pervading her entire being, that it would almost seem, to use the expression of another, "as if the Almighty, in creating the female sex, had taken the uterus *and built up a woman around it.*"

When we consider the important functions of the uterus, and the wonderfully complicated processes carried on within it, and the fact that, the peculiarities of woman, as well as her happiness in health and disease, depend upon, and are in a great measure controlled by, the condition and sympathies of the uterus—the

great central, *pivotal* organ of her existence—is it not strange that any well informed, intelligent physician should persistently close his mind against the evidences of this sympathy, and against the patent fact, that the functions of the most distant organs may be so perverted or destroyed by uterine disturbances, as to deceive the very elect, and lead physicians otherwise skillful, to suppose that these organs are themselves the seat of serious disease? Yet instances of this kind are of daily occurrence. And I am certain that I only state what many of you know perfectly well, when I say that women are often most actively treated during weary months and years, for various diseases which have no existence whatever, except in the obtuse imaginations of the observer—*but are simulated by the reflex sympathies of a diseased womb.*

I could cite to you numerous cases coming under my own observation, which remarkably illustrate this fact, but I prefer to postpone to some other occasion my more particular allusion to them, and will only say in this connection, that such is the mutual dependence of every special branch upon every other department of medicine, that in my judgment, no man can be successful in a special department, without being well informed in all the others. And further, that there is no department of practical medicine which requires such a concentration upon it, of all the accumulations of medical knowledge, or makes such exhausting draughts upon the resources and powers of the physician, and tests so severely his qualities as a careful, painstaking and patient observer, and skillful prescriber, as that of the diseases of women.

Two classes of medical men have, in opposite modes, contributed not a little to bring undeserved odium and disrepute upon the scientific treatment of uterine diseases. In the one class, we see those few, who, having never given particular attention to the subject, are without adequate knowledge of its pathology, etiology and therapeutics, providing themselves with a speculum and a piece of lunar caustic, and with a rashness as frightful as it is criminal, "rushing in where angels fear to tread," carrying fire and sword into the most innocent localities. They find uterine disease in every woman; and the track of their fiery raid can be distinctly traced for years afterward, by the scarred, distorted, narrowed and sometimes obliterated cervical canals which they have invaded. It is these rash and ignorant men—men with as

little conscience as learning—and still less of delicacy than of either, who have been, and are, mainly instrumental in bringing unmerited reproach upon the scientific treatment of the diseases of women.

The unwarrantable and disastrous procedures of this class of superficially educated men, are used as the basis of the indictment of specialism at the bar of public opinion, by another and more respectable class of physicians, who are, doubtless, excellent general practitioners, but who, having long ago abandoned habits of study and reflection, find themselves behind the age; and in casting about to find the reasons for their changed relations, they are quite willing to charge upon "specialism," results which really have their origin in the congenital or acquired conditions of their own minds. The representatives of each class are, I am happy to believe, comparatively few in numbers, (and some may think them too few to require notice) yet such is the nature of their peculiarities, the tendencies of their misguided efforts, and the persistency of their attacks, that they cannot be allowed to pass unchallenged.

It would be out of place in this paper to allude particularly to the "errors of diagnosis," and the results of treatment, made by either of these classes of physicians; yet they are continually coming to notice, and are in some cases exceedingly ludicrous; but in many the consequences are of the utmost seriousness, and not very seldom even fatal to life. Is it any wonder, then, that the public mind is unsettled respecting the value and propriety of special treatment of uterine diseases, when the subject is seen only in the false lights cast upon it from these two extremes of error?

It would be too much to expect the non-professional mind to be able to distinguish the true from the false, respecting a subject which is so variously regarded by the profession itself, and therefore we cannot wonder that suffering women, who have been disappointed in the results of treatment of these affections by their ordinary medical advisers, should finally, in their desperation, seek relief at the hands of male or female quacks. I could easily show that it would promote the highest interests of the public and of the profession, both individually and collectively, to encourage and everywhere commend the labors of "specialists," instead of meeting them with words of ridicule and discouragement; but it is unnecessary, for the line of argument is so plain that it is already anticipated.

Science is a unit. Its multiplied facts are so closely related, and each is so indispensable to the full force and effect of all, that the attempt to ignore or remove from the structure a series of facts, or to cast odium upon the laborers by whom these blocks in the foundations have been wrought and placed in their proper order, would, if successful, utterly destroy the entire fabric. It is an act of sacrilege. It is treason, alike against the interests of humanity, and the civilization of the age.

In all countries, the estimation in which specialists and their labors are held, is the best index of the existing standard of medical education, as well as of the degree of individual culture in the profession. Wherever that standard is highest, there specialties are most assiduously cultivated, and the labors of specialists most highly appreciated; and everywhere, the dependence of general medicine upon *Specialties*, for all that gives it vitality and precision; for all that renders it self-sustaining and progressive, is freely acknowledged by the profession, just in proportion as its members are enlightened, and just in proportion as we have been able to free ourselves from the bondage of prejudice, jealousy, and

ARTICLE XXIII.

HEREDITY.

BY H. A. CARRINGTON, M.D., OF NEW HAVEN.

Under the term Heredity I include the whole subject, as it manifests itself in physiology and pathology, or natural and morbid Heredity. I have no intention, however, of entering at large upon the broad field of natural Heredity, so recently and so exhaustively treated by Darwin; that, surely, were a work entirely superfluous. I shall briefly refer to some concealed points in the matter, as furnishing data which can be used further on in the discussion; and advance from these to more theoretical inductions or reasonings. In the pursuit of theory I hope we shall not lose sight of the practical bearings which our subject has for all of us, since this is the ultimate object of all our professional labors. Fortunately speculation *per se* has little attraction for the majority of our profession, and less, perhaps, in these modern days than ever before; but whoever would practice his profession in any other than a purblind, mechanical way, will seek to know the meaning of the facts which some men are so fond of accumulating; he will endeavor to group and analyze them, to see in what relation they stand to each other, and to the principles of his science; nor be scared from his purpose though he be accused of being a a theorist, an "impracticable."

In relation to our present theme, some of its phases are so recondite, so far removed from any of the ordinary means of physical investigation, that it seems doubtful whether its processes will ever be so refined and nice that, through them alone, we may be enabled to arrive at a solution of these difficulties, though it may be deemed presumptuous, even hypothetically to hint of a limit to the domain of the physical sciences, in anything that concerns matter. In the meantime, and awaiting the advance of science to supply us with exact knowledge, it does not seem unwise to indulge in attempts at speculative or theoretical solutions, which shall at

least be in harmony with the great mass of facts, even if they are not explained thereby. Thus much by way of apology and defence for whatever of theory may be found mingled with fact in the sequel of this essay.

Following the division of the subject already suggested into that of natural and morbid Heredity, for the sake of convenience in the discussion and not because there is any radical difference in the methods of one or the other of these divisions, I propose, in the first place, to make an allusion to, rather than a statement of, some of the principal facts of natural Heredity.

A survey of nature in the realm of life, whether vegetable or animal, shows us this great and unvarying law, that species continue while individuals perish,—the process of renewal is going on continuously, giving to species a kind of practical immortality which does not belong to the constituent elements thereof. It is true that in the pages of world's history as unrolled by geology, we read of races and species once existing and now extinct; but of those with which we are daily brought in contact, we may go searching out their history in the past until historic records are lost in the dim and uncertain dawn of antiquity, and we shall find them in form, feature and function as we see them to-day. Though many dynasties and ages have lapsed since the builders of pyramids perished, "facial angles" remain to-day as they were sculptured then.

Thus we are brought face to face with the great law, the conservative law of nature,—to wit, that of Heredity. And we cannot restrain the exclamation, what a beneficent law it is! Removing, as it does, all the elements of chance from the operations of nature in the domain of life, and so enabling us to count upon the results of vital causes with almost as much assurance as we can upon the results of the law of gravitation.

It is true, that the law of Heredity, as any other natural law, may be interfered with by man and made to subserve his purposes by guiding it in a channel it would not otherwise take. But the law is for the individual plant or animal to repeat itself in its successors, and so on *ad infinitum*, passing along in unbroken succession the peculiarities it received in its turn from its ancestors. Left to the operation of natural causes, in similar conditions, variations from the direct line are found to be but few; but when, on the other hand, some cause intervenes, this natural order of succession may be *deflected* from the straight line of descent, and instead of a repetition of similar forms and functions, we have

changes, or variations, sometimes minute, sometimes very considerable. The wild plant, under the modifying influences of domestication, undergoes, as is well known, very great and even extraordinary changes; experiencing so complete a metamorphosis that without great care we cannot trace the pedigree of its successors. If it be a flower, its beauty, or fragrance, or both, may be wonderfully increased; if a fruit or grain or vegetable, its savory or nutritious qualities may be so developed that it shall seem an entirely new variety to the superficial observer. In this connection we must allude to a class of facts of considerable interest, those I mean classed under the name of Atavism or Reversion; for it furnishes a striking proof of the tenacity with which plants and animals cling to their original forms. There are many striking instances of the tendency of plants which have been domesticated, and changed in their characters, to go back to the wild condition, especially if cultivation is remitted.

That which is true of vegetables and plants is equally true of animals. The laws of inheritance as related to the breeding of cattle, fowls and horses have had of late years a most thorough and scientific exposition. Whenever and wherever men can turn the laws of nature to pecuniary profit, they are very sure to observe them, and work through them, however little they may regard them when they have no such bearing. But not only are material qualities transmissable, those also which we may term dynamical as well, are also inheritable. The intangible results of education are, as a matter of fact, found to be sent on from sire to son. The same is also eminently true of natural aptitudes or peculiarities. It might, on first thought, seem more mysterious or inexplicable that intelligence or mental likeness should be inherited than that physical resemblances should be transmissable. The way out of this difficulty seems to lie through that theory which regards the brain as the organ of the mind, even if not through that yet more material theory which regards mental action or thought to be only a secretion from the brain cells; for similarity of structure being given, we are to expect similarity of function; now by the law of Heredity we get the former, and so, of course, the latter as a necessary sequent.

The subject of hereditary influences is one that has always received attention from the medical profession, because it has always been thrusting itself forward to interfere with or to promote the object which the profession has sought to accomplish in

the relief of pain and the cure or prevention of disease. So long ago as Hippocrates lived, physicians had observed so well and reasoned so acutely that they left little for their successors to discover in this matter. In his theory of the means or method of hereditary propogation, Hippocrates, as we shall see very presently, anticipated the best theories of recent times. He says that diseases are propogated by means of the semen, which, coming from all parts of the body, healthy particles from healthy portions, and unhealthy particles from unhealthy parts, carries them on to a common destination.

Passing abruptly from the days of Hippocrates to our own, we find two other and recent theories in attempted explanation of the curious and interesting phenomena of Heredity, which, from the eminence of their authors and the intrinsic probability that one or the other of them may be accepted as the explanation of the facts, deserve our attention. In the nature of the case—of course absolute proof is not possible, since we are not able to put into action test experiments, and are left to accept or reject theoretical explanations which seem coincident with the largest number of facts. It may be said, however, that *theory* in this matter is of little consequence, since the most correct theory or even absolute truth will not enable us to obviate evils or secure benefits more surely than practical observation has already taught us. While there is a modicum of truth in this argument, it is not conclusive; for, in the first place, it is not possible for men to see daily such a class of facts and not attempt some solution of them; it cannot be expected that men will keep their reasoning faculties in abeyance just because the subjects of their observation are abstruse. Nor again, is it desirable we should resign ourselves simply to observe and compile facts;—if there is a law governing those facts it is desirable to know it, whether we perceive the extent of its bearing or not; whether we perceive how it is to be made practical or not; these are small and inconsiderable matters which should not hinder us in our attempts to discover the truth. With these views I have not thought it unwise or improper in a paper like the present to dwell a little upon the theories of Heredity, to which allusion has already been made.

The first which I shall cite is that of Herbert Spencer, suggested in his Principles of Biology, Vol. I, p. 253.—"The power which organisms display of reproducing lost parts, we saw to be inexplicable except on the assumption that the units of which any

given organism is built have an innate tendency to arrange themselves into that organism. (§ 65.) (This point he has discussed in reference to the reproduction of amputated parts of the tadpole, lizard, &c.) We inferred that these units must be in the possession of special polarities, resulting from their special structures, and that by the mutual play of their polarities they are compelled to take the form of the species to which they belong. * * * * Quite in harmony with this conclusion are certain implications since noticed, respecting the characters of sperm-cells and germ-cells. We saw sundry reasons for rejecting the supposition that these are highly specialized cells, and for accepting the opposite conclusion that they are cells differing from others rather in being unspecialised. And here the assumption to which we seem driven by the *necessities* of the evidence is, sperm-cells and germ-cells are essentially nothing more than vehicles in which are contained groups of the physiological units in a fit state for obeying their proclivity towards the structural arrangement of the species they belong to." For the full elaboration of this theory I must refer to the work from which this extract is taken, where it is set forth with all the author's acuteness and ingenuity, since to enter upon any tolerably full abstract of it would require more time and space than can be devoted to it here.

The other, to which allusion has been made, and which we wish briefly to state, is the more recent one of Darwin, put forth in the second volume of his work on Animals and Plants under Domestication, and which he calls a Provisional Hypothesis of Pangenesis, and which, except in terms, is not unlike that of Spencer's, which we have cited. After a summary of many points of interest in this matter of Heredity, he says,—"I have now enumerated the chief facts which every one would desire to connect by some intelligible bond. This can be done, as it seems to me, if we make the following assumptions; if the first and chief one be not rejected, the others from being supported by various physiological considerations will not appear very improbable. It is almost universally admitted that cells, or the units of the body, propagate themselves by self-division or proliferation, retaining the same nature and ultimately becoming converted into the various tissues and substances of the body. But besides this means of increase, I assume that cells before their conversion into completely passive, or 'formmaterial' throw off minute granules or atoms which circulate freely through the system, and when supplied with proper nutriment,

multiply by self-division, subsequently becoming developed into cells like those from which they were derived. These granules, for the sake of distinctness, may be called cell-gemmules, or, as the cellular theory is not fully established, simply gemmules. They are supposed to be transmitted from parents to the offspring, and are generally developed in the generation which immediately succeeds, but are often transmitted in a dormant state during many generations, and are then developed. Their development is supposed to depend on their union with the partially developed cells or gemmules which precede them in the regular course of growth. * * * Gemmules are supposed to be thrown off by every cell or unit, not only during the adult state, but during all the stages of development. Lastly, I assume that the gemmules in their dormant state have mutual affinity for each other, leading to their aggregation into buds, or into the sexual elements. Hence, strictly speaking, it is not the reproductive elements nor the buds which generate new organisms, but the cells themselves throughout the body.—*Plants and Animals under Domestication:* DARWIN. *Vol. II, p.* 448.

I do not propose to regard this theory as a finality, or to argue for its adoption, as if it were beyond question the truth. The nature of the question does not admit of any such dogmatism; but most minds will prefer to rest on some sort of a theory, or some sort of an explanation. This theory of Mr. Darwin does harmonize with many of the facts, and gives a plausible solution of many things otherwise inexplicable; and, of course, the larger the number of facts that can be fairly explained by it, the greater the probability of its truth. Those who desire to see a full statement of the various arguments by which this position is sustained, must seek it in the work just referred to; here we can only glance at one or two points.

Admitting, then, that the existence of free gemmules is a gratuitous assumption, yet it can hardly be considered a very improbable one, seeing that cells have the power of multiplication through the self-division of their contents. Gemmules differ from true ovules, or buds, inasmuch as they are supposed to be capable of multiplication in their undeveloped state. No one, perhaps, will object to this as impeachable. The blastema within the egg has been known to divide and give birth to two embryo; and Thuret has seen the zoospore of an alga divide itself and both halves germinate. An atom of small-pox matter so minute as to be borne

by the wind, must multiply itself many thousand fold in a person thus inoculated. It has been recently ascertained that a minute portion of the mucous discharge from an animal affected with the rinderpest, if placed in the blood of a healthy ox increases so fast that in a short space of time the whole mass of the blood, weighing many pounds, is infected, and every small particle of that blood contains enough poison to give, within less than forty-eight hours, the disease to another animal.

The retention of free and undeveloped gemmules in the same body from early youth to old age may appear improbable, but we should remember how long seeds lie dormant in the earth, and buds in the bark of a tree. Their transmission from generation to generation may appear still more improbable; but here, again, we should remember that rudimentary and useless organs are transmitted, and have been transmitted during an indefinite number of generations. The objection brought as to the number and minuteness of these cells, will not appear so formidable when we remember that a codfish has been found to produce 4,872,000 eggs, a single Ascalis about 64,000,000, a single Orchidaceous plant probably as many seeds. In these several cases, the spermatozoa and pollen grains must exist in considerably larger numbers. Now, when we have to deal with numbers such as these, which the human intellect cannot grasp, there is no good reason for objecting to this hypothesis on account of the assumed existence of cell-gemmules a few thousand times more numerous.

The facts of hereditary transmissions must be accepted, and some mode of accounting for them is demanded, and I am free to confess that I have seen none that has seemed so probable to my judgment as this theory, or that of Spencer which is really so nearly akin to it. We must have, too, a physical cause,—a positive one; it will not do to take refuge in vague generalities of expression, as "tendencies," and the like,—a physical result must have a physical cause.

Peculiarities of ancestors, of form or feature, of excess or defect, come in one generation, disappear in another, and reappear in a third; leave the direct line of descent and crop out in collateral branches, seeming to obey no law, subject to no rule, but, accepting this theory, they may be more easily accounted for.

One of the most interesting points connected with this matter of Heredity is the fact that, beyond a question, that peculiar intangible something which we call *longevity* is a matter of inheri-

tance, a circumstance not only of importance to the individual himself, but also to the physician, and to the Life Insurance Companies; and in this last respect it seems to me a point more worthy of their consideration than it has hitherto seemed, and from which the applicant who can show a clean bill in this regard, ought to reap some benefit in the reduction of premium. This matter of longevity does not always depend on that perfect ajustment of the functions of the bodily organs which we call health; for not a few long-lived people are descendants of valetudinarian if not positively invalid ancestors, whose weaknesses they inherit not less than their longevity. Again, of certain families it may be predicted that none will outlast a certain defined period. Turgot, a celebrated Frenchman, said, on approaching his fiftieth year, that it was time for him to put his house in order, for his family did not live beyond that—he died in his fifty-third year.

Longevity, says Lucas, belongs to an innate power of vitality, since the privileged individuals possess it from birth; it gives them a kind immunity from disease. While of any given individual life we can only prolicate the proverbial uncertainty, yet of a *family*, we may be assured that a very definite proportion will be certain of old age. This hereditary longevity seems to come nearer to the transmission of dynamic powers than of physical qualities; but however this may be, it *is* a fact of experience.

But not only are bodily likenesses and qualities heritable, the intellectual and moral natures are not less so. We all know instances illustrating this point, in which peculiar traits of character, noticeable oddities of thought, moral obliquities, and virtues as well, crop out in descendants, even to several removes from the starting point. This subject of hereditary transmission of intellectual powers has been very ably discussed, and at considerable length, by Francis Galton, in a work republished by Appletons, to which we would refer any who may be curious to see how far the force of this power seems to go, and how largely genius or pre-eminent talent is really hereditary. The fact that mental or moral qualities should be hereditary, seems, if possible, more inexplicable than that merely physical resemblances are so. We do not suppose that mind itself is passed along; that parents, by giving origin to children, actually generate mind; we must, on the contrary, imagine that these resemblances are due to minute resemblances of the physical basis of mind, viz., brain matter; and that as the brain is the organ of the mind so its physical characters make themselves obvious by mental manifestations.

If we were to attempt to trace out the lateral connections of this theme, we should find ourselves entering upon a wide and well-nigh boundless field, upon discussions concerning the perpetuity of human government, the continuity of social organizations, and of all forms of organized agencies by which men seek to increase and strengthen and continue their influence. Except for this principle in our human nature, governments could not retain their hold upon men, but would be constantly crumbling around us; for, what we call conservatism is only this Heredity,—an instinctive, unreasoning hold upon the status of things "as it was, is now, and ever shall be." In religion, as in politics, in science, as in literature, in art, in ethics, in every thing, we preserve the opinions we have received. A discussion of all this, though not inappropriate in a complete treatise, would not be in place here; and in what yet remains to be said, I shall confine my remarks to the *pathology* of the subject more particularly.

And we inquire, first, what are the diseases we may properly call hereditary? In answer to this question we can only deal for the most part in generalities; and perhaps it might be more easily answered if we reverse it, and ask what diseases are *not* hereditary? for the limits or boundary lines of this subject are as yet unsettled. Our science has not yet walked over this field, nor measured its extent. There are some which are commonly and correctly recognized as belonging to this class of diseases, (not including here the transmission of physical likenesses of excess or defect in structure, as hare-lip and superfluous fingers); we may recapitulate those ordinarily so-called, viz., Tuberculosis, Scrofula, Cancer, Syphilis, Gout, Rheumatism, Epilepsy, Calculus, Insanity, Leprosy, Methomania, structural diseases of various organs of the body, heart, eye, liver, stomach; these, and some others which might be mentioned, are quite commonly classed as transmissible by descent; but they do by no means include all which might be brought into the category.

Passing by this however, we come to another point, namely, the laws which govern the evolution of hereditary diseases. In relation to it, we find that some things are settled with an approach to certainty. The great physiological eras of life in some cases are the exciting causes; chorea and epilepsy developing about puberty; cancer of the womb and breast, in the majority of cases is said to appear when the physiological functions of those organs are about to cease; tuberculosis is more apt to appear from the

twentieth to the thirtieth year of life; gout, generally after the thirtieth. These, and other such facts might be cited, but doubtless are not needed in this audience, being well known to all; much, however, yet remains to be known, and while we may hope great things from the advance of science, we cannot be very sure that we shall ever penetrate the vail that hangs over this subject. It seems to me, however, that in one way we may set ourselves right, and that is by correcting a wrong use of words. Medical men are in the habit of using words here, if not elsewhere, which have nothing definite about them, and which either give a false meaning, or else so vague and general an idea, that it comes to nothing. All our text books and medical essays are full of the words, constitutional predisposition, hereditary predisposition, diathesis, tendencies, &c. Instead of saying that a predisposition is inherited, it seems more philosophical to say shortly and simply, that scrofula, cancer, etc., are hereditary. Disease is not a metaphysical abstraction, but a physical reality. It is common nowadays to say that disease is not an entity, but only a disturbed function; doubtless functions are disturbed, but what disturbs them? It is something positive, physical, something which, if our analysis were refined enough we could always come at. A symptom is not a disease; it only reveals disturbed functions. Now if we can go behind these and place our fingers upon the cause at work in the system and isolate it, then we have what we may properly call the disease.

In the reaction against mechanical theories, it seems to me that we have gone over to the other extreme of vitalism and ascribe to the vital dynamics something which has no existence, but is only a philosophical abstraction. If disease is a physical result of a physical cause, then that cause must be susceptible of demonstration, and we may hope to reach it. If, on the other hand, we take refuge in misty uncertainties, and talk about diathesis and predispositions, we seem to be making an attempt to hide ignorance. The fact that a disease is not developed for many years, but lies, as it were, latent, in the system, does not militate against the position we have assumed. A tree grows during a period of years with no sign of fruit-buds; but when the right time has come they develop. For the blossom of the century plant people are content to wait many long years, knowing that the germs though hidden will inevitably appear. Take the changes which the human system undergoes at puberty; for twelve or more years the growth of the body does not hint of the hidden capacity which will

then be revealed. Shall we say there is a *predisposition* to sexual maturity? If we sever the fallopian tubes or remove the testes the predisposition ceases; the individual may go on in the development of physical growth, but certain capacities, though thousands of generations have strengthened the predisposition thereto, are not developed. Destroy the poison of syphilis, whether by local or constitutional, by primary or secondary treatment, and you destroy the disease and its manifestations. Prevent the absorption of hydrophobic poison and you choke the disease in its origin. You strangle it, to use an hibernianism, before it breathes. So you may travel through the whole range of morbid poisons, those which are hereditary as well as those which are not, and you will find that when you have destroyed the germ, you have destroyed the predisposition.

Viewed in this light the theory of Spencer with his physiological units, or of Darwin with his gemmules, seems to give a more rational aspect to medical doctrine, and to place it upon a somewhat surer basis. Instead of saying that one inherits a diathesis, a predisposition, a tendency, words which are as vague and undefinable as words well can be, we shall say that he inherits scrofula, or syphilis, or cancer, and set ourselves to the definite purpose of seeking how we may destroy these germs of disease. To say that a person has a constitutional tendency to consumption, is to deal in a periphrase either without meaning or with a false one. I would say, on the contrary, such a one inherits consumption *in esse*; and considering the germs of the disease, though undeveloped, as positively in the system, would set the definite aim before me of destroying them.

Perhaps you may accuse me of being altogether too materialistic in my views; but I cannot hide from myself this fact, that the progress of medicine has been in this direction rather than another. What though we have not isolated the particular poison of scarlatina, we know that it exists, that it is portable and transportable, and may be destroyed. Our physical means of investigation may never be so refined that we shall be enabled thereby to isolate it, but our confidence in its existence is unshaken by any such doubt. Unprotected by vaccination you pass by a person in whom variola is just developing; and though science may never be able to weigh it in its balances, however delicate they may be, or to see it through any microscope however powerful, you will not be in doubt in due time that in through some avenue of the body there stole in upon you a poisonous germ of intense activity.

In regard to "constitutional tendency," it seems to me that the only sense in which we may say that there is a "tendency" to disease, is when a person exposes himself to the reception of the germs. A man has a "tendency" to syphilis when he seeks connection with a syphilitic woman; but his children inherit the germs of that disease, unless it has been eradicated before they were begotten. The "tendency" to disease, rightly understood, is only the *latency* of disease. We may say, correctly enough, of certain employments, that *they* "tend" to produce certain diseases, as instanced by workers in phosphorus or quicksilver; but as descriptive of Heredity influences, it seems to me we cannot rightly use the word. What parents transmit is not a "tendency" but an actual germ of disease. Diseased structures, no less than healthy organizations, reproduce themselves,—the cancer-cells have a reproductive activity as great as any other cells; why should it be thought a thing incredible that they may throw off into the blood infinitesimal gemmules, which, through father or mother, may pass into the system of the child, and at some period of the future, manifest themselves as in the parent? And we can no more refuse to admit the doctrine of the inheritance of pathological germs, than we can dispute that of the physiological germs. How it is possible for the sperm cells to contain all that they must carry with them, if this doctrine of transmission is true, I am not prepared to explain; and only contend that it is a fact; and that by asserting it we have a consistent theory, at least, and one that we can understand. For, if the infinitesimal "units" or "gemmules" are carried forward from generation to generation, and at last, under favoring conditions develop and display themselves, it seems something tangible; we can imagine how they may be carried on over one or two generations, to appear in some distant branch; we can imagine how a son may receive from his mother, and pass on to his daughter, the germs of uterine cancer; and how these germs stray off from direct lines of descent and appear as we so constantly see them doing, in collateral branches. But with the words predisposition, and diathesis, in the usual acceptation of those words, we are taking hold of nothing but air. Bichat long long ago characterized the "Le mot diathèse est une expression hérétique qui sert aux médecins à masquer leur ignorance." By accepting this theory we give consistency and tangibility to our doctrines, and substitute a definite proposition which every one can comprehend, for a metaphysical abstraction which no one understands.

ARTICLE XXIV.

EPITOME OF THE PATHOLOGICAL RELATIONS AND TREATMENT OF UTERINE DISEASES.

Read before the New London County Society, April 16th, 1879

BY E. FRANKLIN COATES, M.D., OF MYSTIC BRIDGE.

It is more than twenty years ago that we find the following from the pen of Dr. J. Henry Bennett. "It cannot be denied that cauterization of the cervix is an operation, and, like all other operations, surrounded with danger. It must not therefore be either injudiciously resorted to, or carelessly carried out. I recently learned from M. Gendrin, that within the last few years he has had several cases of acute metritis, and of abscess of the lateral ligaments, the evident and immediate result of deep cauterization. He also tells me he has seen the same results follow the use of nitrate of silver and of injections; and I may mention that the two most severe instances of acute metritis that I have myself witnessed for some time, in the unimpregnated womb, occurred after the use of weak astringent vaginal injections. While, therefore, this mode of treatment stands first on the list of remedies because of its efficiency, it is also the most hazardous if incautiously employed; and requires on the part of the practitioner, the most watchful attention, both as to the manner of using it, and to its subsequent effects, in order to render it perfectly successful."

That the experience of twenty years ago is not profitable to all of the present day may be inferred from the following, which is copied from an editorial in the *Medical Gazette* for Sept. 12th, 1868. "Gynæcology is now the rage, and multitudes of epicene specialists are plying their vocation in every quarter of the civilized globe. Unfortunately the majority of these have become so

accustomed to looking at every thing through a uterine speculum, that their range of pathological observation is bounded by the walls of the vagina, and their repertory of anatomical knowledge narrowed down to the fact that every female has a womb, which organ, in their estimation is the "fons et origo" of all possible disturbances of the feminine system. If there be the slightest deviation from what they choose to consider the normal standard, straitway all the paraphernalia of modern science are brought into play, and the martyred viscus is invaded with sounds, dilated with tents, bruised with clumsy inserted pessaries, lacerated with bilateral incisions, abraded with escharotics, and pushed to its furthest limit of endurance by every means of irritation that human ingenuity can devise. It seldom occurs to these "womb wallopers" that the local difficulty upon which they concentrate their whole attention, may be, and in very many instances undoubtedly is, merely one of the symptoms of a morbid condition, an effect, rather than a cause. It is most earnestly to be hoped that a reaction may soon set in, which will leave in the hands of the very few really qualified gynæcologists, the few cases that really require such treatment, and drive into deserved obscurity the herd of "specialists" in that department, whose only recommendation is that they are unfit for anything else."

I find translated from the *Gazette Hebdomadaire* an article from the pen of Dr. O. Saint, Vel, in which he says, "In proportion as gynæcological experience increases in the hands of the practitioner, it leads, not to diminished confidence in the efficacy of surgical interference, but to increased prudence and reserve in its application, stamped with a certain amount of hesitation in the employment of it. The uterus, indeed, is not an organ which supports indifferently, and in equal measures the various traumatic lesions. The susceptibility of the neck, *nil* in a greater number of cases, is extreme in others; and furthermore varies according to the nature of the traumatic agents. Nothing in the anatomical or physiological disposition of the organ, nothing in the general condition of the patients, or even in the morbid influences surrounding them, accounts for these differences, singular as differences of election, and so grave sometimes in view of the consequences."

The expression, *uterine diseases*, will embrace all those diseases which affect the uterus in its unimpregnated state, whether originating within itself, or in its surroundings, which will include the whole pelvic viscera; and from the foregoing extracts it will be

inferred that those who have the best information, based on a large and well digested experience, will be the most cautious in their treatment.

The uterus is not only in intimate relation to the organs within the pelvis, but by means of the cerebro-spinal and ganglionic divisions of the nervous system, it has properties derived from each, through which it is influenced by the diseases of other organs, and in its turn sends an influence radiating from itself to those parts of the body farthest removed from it.

The inflammatory diseases of the uterus itself are those to which we are most frequently called, and they require tact, knowledge and skill for their successful management. The anatomy of the parts should be thoroughly understood; we should be familiar with the situation, size, shape and relative position of the pelvic organs, and the connective tissue that binds them all together; the histology should be known that we may perceive the pathological changes that occur in each particular part and tissue, so as to be able to ascertain the trouble, and arrive at a correct diagnosis of the disease with its complications, and the reflex action of the diseases of other organs upon it. Then, with the habits of the patient, and her external influences duly considered, the prognosis, which is often difficult, may be somewhat satisfactory, and we may be able to give an intelligent reason for all our doings.

The effect on the part is not the disease oftentimes, any more than the effect on the constitution; and both are to be considered in practice; for primitive diseases by their mechanical consequences may produce embolism and fibrinous deposits on the valves of the heart. The relations of local diseases and constitutional conditions are seen in Septicæmia and pyæmia; Exanthematous and other diseases are often the result of blood poisoning; and phthisis not unfrequently results in, or is occasioned by Endometritis. "The routinist should be converted into a physician," for no particular line of practice can be given; the causes should be investigated, with the effects produced on the part, and on the whole constitution.

We find Metritis of the body and neck of the womb; Endometritis, also both cervical and corporeal, or the os and vaginal surface only may be diseased. Ulcerations in various forms occur, and flexions and versions in numerous ways are not uncommon. The uterus may ascend or descend in consequence of diseased action, and may become partially or wholly inverted. There may be

hypertrophy, subinvolution, superinvolution or atrophy of its walls. We have fibrous tumors in abundance, both sessile and pedunculated; fibroids, submucous, subserous and interstitial; polypi, fibrous, cellular, glandular and sanguineous; and also cancers, encroid and epithelioma, to harass the patient and push her towards the grave.

There are extra-uterine complications sufficiently frequent and abundant to caution us in all our examinations and practice, not to overlook them if present or produce them where absent, so that conscience may not upbraid us for want of knowledge, or for meddlesome interference. Here we have cellulitis, peritonitis, salpingitis, pelvic hæmatocele, ovarian inflammation, displacement, dropsy, tumor or abscess. Any of these may be the cause instead of the complication of uterine disease, or they may exist without it. We also find rectal diseases, fistulous openings, coccydynia, stone, cystitis, urethritis, fecal impaction, and enteritis, which by reflex irritation may cause or very much complicate uterine disease. The relations of the rectum to uterine disease are well illustrated in a recent paper from Prof. H. R. Storer of Boston, in which he considers it of so much importance as to advise that it be examined in every case. This examination becomes absolutely necessary in very many cases, and should always be instituted when there is an intelligent reason for it.

Constitutional diseases, by the effect they produce on the organism, may be the cause of uterine disease. A diseased liver, with its sluggish portal circulation, disease of the heart or lungs, by causing deranged circulation, or preventing proper oxydation of the blood, and diseases which are the result of high inflammatory excitement, or which leave the system in an anæmic state; also blood poisoning, the syphilitic taint, or strumous diathesis may produce it. In those of delicate constitutions, with white skin, light hair, and lax muscular fibre, trifling accidents as damp, cold, sudden changes of temperature and moral influences may cause it. In the poor and lower classes it is brought on by impure air, bad food, fatigue, sedentary occupations and exposure; and in the wealthy, by indolence, want of exercise, vitiated air, and irregular hours; requiring in the majority of cases little local treatment, but a tonic and invigorating course with a nutritious diet, exercise in the open air made agreeable, judicious bathing, etc.

With experience any one can read to greater profit; and the improvements in gynæcology within the last few years have been

such that he who has not been particular to keep up with the literature of the subject, will often find himself sadly in fault in practice, and the marked advance within the last twenty-five years, gives reasonable promise of rapid progress in time to come.

All our examinations should be made thoughtfully, not as a routine, but with an object in view. The general appearance of the patient, the countenance, expression, movements, habits, state of nervous and vascular systems, heart, liver, kidneys, bladder, stomach and bowels, spine, skin, and all external or surrounding influences are to be carefully looked after. In manual examinations the vaginal touch should be delicate, and yet so thorough as to detect any disease that may affect the pelvic viscera. With conjoined manipulation, the size, shape, sensitiveness, regularity of the surface and the position of the organ may be known. The state of the ovaries, areolar tissues, broad ligaments, anterior vaginal wall and the bladder should be minutely considered, and if disease be suspected in the posterior vaginal surface or uterine wall, or if we are apprehensive of pelvic tumor, peritonitis, cellulitis, hæmatocele, fecal impaction or internal hæmorrhoids, then the rectal touch alone, or combined with abdominal palpation, or the double touch will very much assist our investigation. By the uterine probe we discover the capacity of the uterus, the course of its canal, and the existence of inflammation and growths within it, and are able to differentiate hypertrophy, involution, and fibrous tumors from cellulitis and ovarian diseases.

These are our best and surest means for diagnosis, and, therefore, most to be relied on. But the speculum assists us by the sight, in inflammations of the vagina, cervix and os uteri, and in some cases of cervical metritis and endometritis. It is an instrument, however, that becomes indispensible in the treatment of the greater portion of uterine diseases. Of these instruments there is a great variety, but in common practice without an assistant there is no instrument that can compare for utility, cleanliness, and adaptability to every case, with Dr. Ferguson's cylindrical glass speculum. Some object to it, because it is not so easily introduced as others, and "pushes the uterus upwards, increasing thereby any flexure that may exist." While it is not useful in some cases for investigation, and in some of the operations on the vagina and uterus as some of the duck's bill and valvular varieties, yet in common practice I like it best. After the location of the cervix is ascertained, Prof. Thomas of New York recommends in its in-

roduction that the perineum be depressed by the tip of the finger and that the instrument be "slowly and gently inserted and carried to the cervix." The most sensitive part is the meatus urinarius, and the instrument rubbed against it will give pain, which may be avoided, as experience has taught me, by introducing the tips of three fingers (the index, middle and ring) between the labia and partly within the vagina, the index and ring touching each other, and the middle finger resting upon them; then separating the labia with the index and ring finger, protecting the meatus with the middle finger, and introducing the speculum, depressing the perineum with it as it glides easily along the passage. By so doing I have found it as easily introduced as others, if a suitable size is chosen.

Besides these, it may be necessary to examine the bladder by sounds, or combine it with the rectal touch. Dilatation of the os by tents, digital examinations within the organ, and the exploring needle within its surroundings are often necessary. Auscultation and percussion, the microscope, and even the endoscope, may sometimes be necessary to complete our diagnosis.

Some believe that local treatment is not necessary for the majority of patients; that the common cases of inflammation and ulceration only require rest and internal medication suited to the condition of each; that when the system is brought to a healthy state, the local disease, like an old ulcer of the leg, will then get well. Others affirm that local applications are necessary in all cases in order that the disease be arrested so as to prevent further mischief.

Constitutional treatment is, to a greater or less extent, necessary in most cases, and when we find the local difficulty dependent upon any particular functional or organic disease of other parts, or state, condition or diathesis; or detect an impoverished state of the blood, or disease of any particular part or organ which, by reflex irritation, may cause or complicate it, then such medical or surgical measures as will remove or relieve such cause or complication are certainly needful. Often it is best not to make any local application until the system, part or organ diseased, is first brought to a healthy condition; and then in such cases we shall find the uterine disease very much improved, if not cured. But cases are often met with having many grievous complications or conditions that may cause or aggravate them, and in which the experienced touch and eye will immediately perceive

that local measures are necessary to effect a cure, all other means combined being ineffectual. The great business of the practitioner should be to determine when he should interfere, and when he ought to abstain from interfering.

In some cases of uterine disease the vagina or the vulva is in some way affected thereby, and in turn the vagina especially may take on diseased action, which, by extending upward, is communicated to the uterine surface. Vulvitis may be simple, phlegmonous, follicular, gangrenous, or the result of eruptive diseases; and phlegmonous inflammation may be mistaken for inflammation of the vulvo-vaginal gland, pudendal hernia or hæmatocele or even for feces in the rectum. The very common disease—pruritis vulvæ—is not usually an idiopathic nervous hyperæsthesia, but the direct result of some irritating discharge, local inflammation, or eruptive disorder of some kind.

Vaginitis, whether simple specific or granular, frequently calls for active interference, for if the disease is allowed to progress the consequences may be both troublesome and dangerous. The simple form, even when chronic, is not apt to have many complications, and in time usually subsides in simple vaginal leucorrhœa. But the specific or gonorrhœal form, which at times it is impossible to differentiate from the simple, is sometimes a very grave disorder and has been known to destroy life; for by extension it may produce urethritis and cystitis, and passing upward to the uterus, result in endometritis, or farther still in fallopian salpingitis or pelvic peritonitis. While the latter disease is caused by imprudence during the menstrual period in one-fifth of the cases, gonorrhœa is said to produce it in one-quarter, and even pelvic cellulitis is superinduced by it in more than one per cent. of the cases as they occur to us in practice. Vaginismus, though usually occurring in the hysterical diathesis, is commonly the result of local inflammation, tubercle of the meatus, excoriations, fissures or eruptions. The worst case I ever saw had obliged the patient to live *sepse marito* for ten years, and was the result of a small ulcerative fissure at the fourchette, which had hitherto eluded all search.

In inflammations of the uterus we have endometritis and metritis, which always to a limited extent affect each other, though they are considered as separate and independent diseases, which may sometimes be found together in the acutist variety, but do not often coexist in the chronic form. Either may, and commonly does, affect the cervix alone, but both may, and sometimes do,

affect the body. Cervical metritis and endometritis being by far the most common, are the most liable to affect each other, and are found to exist together more frequently than diseases of the same structure above and below the os internum, whether of the parenchyma, or of the canal. It becomes necessary in practice to know how far this inflammation extends, where it has its seat, and what is involved. We rarely find inflammation of the vaginal surface (except it be the result of friction, pessaries, or direct injury of some sort) which does not extend within the os, inducing more or less leucorrhœal discharge, which is nothing more than an isolated sign of a pathological state, as congestion, inflammation, or granular degeneration.

Endometritis is a glandular disease, affecting the Nabothian follicles of the cervix, and the utricular follicles of the body, and the altered secretions may be either mucous, mucopurulent or sanguineous. Rust-colored leucorrhœa or dilitation of the internal os, is characteristic of internal corporeal disease; and increase of the size of the uterine cavity is evidence of disease of the parenchyma of the body; but sensitiveness to pain will usually settle the question unless the nervous system is badly involved, which is not uncommon, and then the hyperæsthesia is liable to deceive us.

In treatment, all aggravating circumstances and conditions should be removed or ameliorated as far as they can be; the constitution should be improved by the ferruginous and bitter tonics, the nervous system calmed by the bromides, opiates or the hydrate of chloral, or fed by the alkaline phosphates; or any other internal remedies should be used which the case shall require or demand; and then such local measures should be tried as shall be indicated by each particular case.

The practice of applying the solid nitrate of silver to all cases is empirical, and many of our leading gynæcologists rarely use the pencil. Dr. Emmet, Surgeon-in-Chief of the N. Y. State Woman's Hospital, says—"It is the practice of too large a portion of the profession to direct all their local treatment to the observed condition of the neck, while if it is but the outcropping of the disease within the canal, even when healed, a temporary result only is gained, as a relapse will occur. * * * * The nitrate of silver in the solid form, is in more common use, from its supposed mild action, than any other agent for local treatment; yet from indiscriminate and too frequent use it has done more harm than any of the stronger caustics. * * * * Its use I have almost entirely abandoned and confined myself chiefly to a solu-

tion not stronger than forty grains to the ounce, to aid the action of some previous application. It is not that I would so much deprecate its use in the hands of an expert, but, from its convenient form, it is too great a temptation to many, who are the most ignorant, to flatter themselves that they have mastered the art, as a specialty, when once in possession of a *porte-caustique* and a speculum."

Others of high authority think differently. Dr. Kammerer, Physician to the German Hospital and Dispensary, N. Y., in speaking of nitrate of silver, says—"It has lately been somewhat brought into discredit by the accusation that it produces induration of the cervix; but allowing that we find such induration in cases where nitrate of silver has been extensively used, where is the proof that this induration has been produced by the remedy in question? * * * * I have not abandoned a remedy which has done me excellent service in many cases where no other local treatment was resorted to."

It is an undisputed fact that, though the action of lunar caustic is superficial, its continued and too frequent use is liable to produce induration and cicatricial contraction, and my experience coincides with the following from the pen of Dr. Emmet.—"I consider a successful termination of the treatment of uterine disease to be just in proportion to the amount of induration remaining afterward. For it is impossible for the uterus to perform its functions properly if the cervix is left to a great degree a mass of cicatricial tissue, and sterility must invariably exist. Moreover, this condition, whether the result of disease overlooked, or arising from local treatment, is certainly an exciting cause of irritation to the nervous system, so that indirectly the nutritive functions become impaired, and tuberculous deposit is frequently a consequence."

It may be given as a rule, that whatever the article used may be, the stronger it is the longer should be the time between the applications, though some milder article may do excellent service in the interval. All our applications should be made directly to the part diseased, with a definite object in view, whether it be to exert a direct alterative influence, to promote the absorption of effused lymph, to give tone to the tissue, or to calm, soothe or quiet nervous irritation and pain.

Chromic acid in the treatment of uterine disease was introduced to the profession by Dr. Marion Sims of New York, and is now

extensively used by the leading gynæcologists of the country, but it is chiefly applicable where foliaceous growths or vegetations are to be destroyed. Iodine, and, for some few cases the acid nitrate of mercury, is useful where there is induration or hypertrophy of tissue. Sulphate of copper, either solid or in solution, does excellent service in some cases of granular disease like those of the eyelids, on which it is known to be so useful. Solutions of chloride of zinc usually leave the parts with healthy granulations and are beneficial in phagedenic ulcerations and abrasions with sanguineo-purulent or ichorous discharges. The solution of persulphate of iron, the muriatic tincture, carbolic acid, or pyroligneous acid will be of service when applied to erosions with a tendency to hæmorrhage. A solution of sulphate of zinc is a valuable astringent in those cases of hypersecretion where no erosions are visible, and tannin or pulverized alum wrapped in muslin with a string attached, will be oftentimes useful and permanent in their effects. A wad of cotton, with string attached, saturated with glycerine and applied to the os and left for a few hours after an application, is often beneficial as a ointment, and sometimes no other application is necessary; and some narcotic substance, as morphine or belladonna, in a vaginal suppository is useful to relieve and quiet pain.

In cases of chronic inflammation of the parts surrounding the uterus, or of the uterus itself, with hyperæsthesia, the vaginal bath or irrigation with hot water from 100° to 104° for half an hour at a time (the stream being constant, but never forcible,) so as to corrugate the parts, is often comforting and beneficial; but where there is much relaxation or dilitation of the uterine canal, and especially if it affects the internal orifice, fluids of low temperature should not be injected, for a cold vaginal injection has been known to enter the uterus, and, by passing down through the Fallopian tube, cause death from peritonitis. Where it is necessary to retain medicated solutions within the vagina for a considerable time, a soft, round sponge, about the size of a pullet's egg, with a string attached, saturated with a solution of sulphite of soda, morphine, or any other substance, either alone or combined, can be easily introduced by means of a tampon placer or vaginal suppository tube; but sponges should be removed as often as morning and evening, or should be used for only a few hours of the day, for any foreign substance left too long in the vagina is liable to cause inflammation.

In cases of pure metritis, blistering the vaginal surface of the

cervix with the warm iron, the actual cautery, vesicating collodion, or the solid nitrate of silver, is called for in some cases; and where there is much engorgement, local depletion by simple scarification, leeches, dry cupping by the hard rubber cylinder, and then bleeding with Battle's scarificator, are frequently of great benefit; but the tendency to spanæmia in these cases, should make us cautious in the use of all depleting measures.

In the application of solid nitrate of silver within the cervical canal, Lente's silver probe is the most convenient instrument. I have used a quill cut at both ends, armed with the caustic, and in the other end of which is inserted a rod eight or nine inches long, bent near the end to suit the curve of the canal; but the pencil, if pure, is liable to break and be left to produce a greater effect than is desired; I have often used the solid sulphate of copper in this way, and it has done me excellent service. In many cases of follicular inflammation of the mucifcrous and sebaceous glands of the vagina, with small superficial ulcers, or diphtheritic patches, and in most cases of diphtheritic disease of the throat, and in chronic enlargement of the tonsils, I like this remedy locally better than any other. In the application of liquids, there is no instrument so convenient or useful as Emmet's applicator, which is an improvement on that of Dr. Sims, inasmuch as it is made of pure silver, and when the exact curve of the canal is ascertained by the small silver probe previously used, this instrument, wrapped with a thin film of cotton and bent to the probe, after being dipped in the liquid, can be easily carried to the os internum, and above it if necessary. I now rarely use any other instrument, and a saturated solution of nitrate of silver is strong enough for most cases. All other liquids can be used by it of any strength desired.

In corporeal endometritis there are no local means of much service unless we inject the cavity, and those who have tried this measure have mostly abandoned it on account of the severe uterine colic it occasions, often accompanied with nausea, vomiting, great prostration, and grave constitutional symptoms. Severe pains and hysterical attacks have followed the simple injection of warm water; but we find even strong caustic solutions recommended by Vidal in 1841; by Velpeau in 1842; by Ricord in 1846; by Evory Kennedy in 1847; by Debouney in 1849, and by Sigmund in 1857; and while they approved of the remedy in certain cases, just as good authority is found to disapprove. Since 1857 I cannot find authority for the use of intra-

uterine injections until within the last year Dr. Kammerer and Dr. Nott, of N. Y., have each informed us that they were both safe and useful, and I believe from my own experience that the reasons for former disagreement are fully explained by Kammerer, who tells us—

"1st. Avoid all intra-uterine treatment while there is any irritation or inflammation in the peri-uterine tissues or in the cavity of the body.

2d. Beware of injecting fluids of a low temperature into the uterine cavity.

3d. Concentrated solutions should be injected in minute quantities only, (10 to 20 drops.)

4th. The entire permeability of the uterine canal shall be established before the injection is made."

The canal must be dilated so that there shall be ample room for an easy return of the fluid, and the cavity must not be distended by the fluid. We may dilate by tents, dilators or probes, but as their full dilatation is absolutely necessary before each and every injection, the graduated sounds made use of by Dr. K., or the dilating forceps of Dr. Nott, will be more convenient for us than the sponge or laminaria. All are aware that intra-uterine applications are harmless after full dilatation produced by abortions or labor at full term, but we cannot expect such dilatation as this; therefore, whether we use the long sounded syringe catheter, or double canula, we must not risk colic or entrance into the Fallopian tubes by distension. Strong solutions should at first be used in very small quantities, and never in a greater quantity than 15 or 20 drops.

In most of the inflammatory diseases of the uterus it is common to recommend that the patient abstain from exercise, keep herself most of the time in bed, and, if a married woman, lie separate from her husband. This I believe to be excellent practice in all cases of acute inflammations, and cannot be too rigidly enforced. Most cases of chronic disease occur in those of a lymphatic temperament, with lax muscular fibre, and of weak, deranged, or broken-down constitutions, and there the tonic, invigorating course of treatment above mentioned will benefit, and exercise to a greater or less extent in the open air becomes indispensable to the cure. The poorer classes, who are obliged to exercise to live, get well as readily, if not more so, under proper treatment, as the

upper classes who have nothing to do but loll upon their sofas from morn till evening, indulging their indisposition or indolence by want of exercise; and these I find the most difficult patients to cure. A well regulated hydropathic hospital, where they will be roused at daylight, put into sitz-baths, packed with wet towels, rolled upon the floor or made to walk before breakfast, is generally a good place for them if they cannot be otherwise made to become interested in some kind of exercise that will in some way make them forget their ills. The middle classes who will exercise, and even those who do not always lie separate from their husbands, except when it gives them pain, generally get well the best; and when well the disease in them is not so apt to return. Good judgment should regulate all these affairs, and it is our business to see that it is turned to a good account.

We often find ulcerations in connection with inflammatory disease and rarely alone. To these the strong caustics should generally be applied. In the fungous or cock's-comb variety, resulting from excessive proliferation of connective tissue of the submucous layer, or in eversion of the cervix, the result of papillary hypertrophy, we should snip the exuberant growths or "hæmorrhoidal membrane" with the curved scissors or apply the hot iron. If any of these come in consequence of slitting the cervix from any cause, then the knife or scissors and the suture may be needed. In the follicular variety the contents of the sac should first be evacuated and the cavities cauterized. In all, the cause should be first looked after and removed if possible. In the syphilitic form all local means are of but little avail without the needful constitutional treatment.

In malignant disease, whatever its variety may be, we can do but little except to procure temporary relief, for it is not often that the physician is consulted until the second or ulcerative stage of the affection, and then we must relieve the pain, correct the fetor, check the hemorrhage, and support the strength of the patient. Dr. Churchill speaks favorably of nitric acid as a caustic in these cases to accomplish the first three indications. It is difficult to diagnosticate the disease in its early stage, before the menopause, but after that period, the appearance of the disease is more likely to awaken suspicion, and when we realize that one-third of the women who die of cancer, have cancer-uteri, as statistics prove, it is of great importance that we recognize the disease early, for though true cancer "arises from a constitutional vice," epithelioma

(though rare compared with the encephaloid variety) has, doubtless, a local origin, and if recognized early enough, as in most cases it may be, or we can have valuable testimony thereto by removing a small section of the indurated portion and examining it under the microscope, it can be cured by amputation of the neck, or by the strong caustics. Dr. Skene of the Long Island College Hospital recommends for their removal the introduction of "caustic arrows" of chloride of zinc into punctures made within and around the malignant induration, and gives two cases of perfect success attending the treatment.

In these remarks and suggestions, hastily thrown together, I have not expected to bring forward anything new, but only so to group the mass of knowledge pertaining to this specialty, that it may be comprehended at a glance. If any shall be led to more careful thought, thorough reading, and critical study, my object will have been accomplished.

ARTICLE XXV.

FIBROUS TUMOR OF THE OVARY IN A GIRL THIRTEEN YEARS OF AGE.

Read before the Bartlett County Society.

BY E. W. GERWOLD, M.D., OF ROCKY HILL.

In the middle of July, 1869, I was called to see a girl (lacking one month of thirteen years) suffering from a diarrhœa, accompanied by vomiting and pain in the bowels. Made only an ordinary verbal examination of the case at the first visit; administered two or three small doses of sub-muriate, to allay the vomiting, followed with morphia in combination with carbonate of soda and rhubarb; and on the third day found the disagreeable symptoms had subsided, and that the case seemed in the way to entire recovery. Prescribed the comp. Tr. Bark, and discharged the patient. Saw the girl on the street some days after, when she told me she had got quite well.

At the second or third visit made as above mentioned, I ascertained, on inquiry, that the girl had not been feeling quite herself for nearly two months previous. Observed she had lost some flesh and some of her usual flush and glow of exuberant health. I was in the way of seeing her often, here and there, and so noticed that she had changed some. Up to the early part of the summer she had been as well and healthy a child as you ever meet.

About three weeks from the time of my first visit, I was called again, and found a return of the symptoms, though not so severe, with the addition of a good deal of anæmia. Checked the diarrhœa—enquired if there had ever been any appearance of the menstrual function, and was answered in the negative. Concluded that more or less of the bloodless appearance of the case had a connection with the non-appearance of the menses; prescribed quinia and iron right along, on which there was marked improvement. Saw the girl three or four times in the course of the month of August, up to the 26th, during which time she seemed

to be on the gain. After the 29th of August, did not see her professionally until the 15th of October, but met her often on the street and elsewhere. Said she felt about as well as usual, though not as strong, and she did not regain her old color, though much improved in this respect.

October 19th there was return of pain in the bowels, but no diarrhœa—tenderness over the upper part, with some pain low down—a little to one side. I now ascertained that there was a hard, rounded protuberance in the extreme lower part of the abdomen, almost if not quite exactly in the centre, and as if extending up from the pelvis, and simulating in its form and other appearances a gravid uterus. The growth of the tumor from this time on was almost precisely the same as a pregnant womb—its feel the same; but the appearance of the *patient* did not indicate pregnancy. The anæmia returned and increased. The appetite was capacious, bowels generally regular. Sleep good. Pulse increased in frequency, and weak. No soreness over the tumor at any time—not even tenderness, and scarcely any pain, except for about two days, at intervals of four weeks, and then of a character simulating the pains of the monthly period.

An examination per vagina gave precisely the same feel to the finger; the tumor could be lifted, and would settle back the same as a pregnant womb; all was like, except that you could not make out the os.

Treatment failing, and the case going on rapidly, in the early part of January I consulted with Drs. Hawley and Barrows, of Hartford. There was no betterment; the patient continued to go down very fast, and died the 4th of February, somewhat less than seven months from the time I first saw her, and about nine months from the earliest symptoms of a decline. At her death the patient was as large as a woman at nearly full term with child.

A post mortem, made by Dr. G. F. Hawley, with Dr. Barrows and myself, showed a nearly round fibrous tumor attached to the left side of the uterus for the entire length of that organ, the uterus itself being in an undeveloped or non-menstruating condition, and apparently healthy except for the attachment of the tumor. The left ovary was imbedded in the central part of the mass. The opposite ovary was healthy. Weight of the tumor, 9½ pounds. The liver was enlarged to twice its natural size, and badly degenerated with fatty deposit.

Dr. G. F. Hawley having made a more particular examination, has kindly given me the following:

"Several cavities, from the size of a pea to that of a large English walnut, were found in the liver, filled with what in appearance resembled a cheesy mass, together with a little fluid. This mass disclosed nothing under the microscope but broken down tissue, liver cells and oil globules. Nothing of a tubercular or cancerous character was found here or in any part. The stomach and spleen appeared normal. Intestines and omentum slightly congested. The kidneys, though of normal size, were soft, and, like the liver, undergoing fatty degeneration.

"The tumor occupied the whole of the peritoneal cavity, to at least as far as the umbilicus, and had entirely concealed the left ovary within itself. There were a few adhesions between it and the peritoneum upon its left side. Here, as in the liver, were cavities of various sizes, filled with similar cheesy deposits and broken down tissue; but the microscope showed nothing of a cancerous or tuberculous character."

It is a question worthy of consideration, what were the inducing causes of disease in this case? The parents and more remote ancestors of the child are and have been healthy people. There was nothing hereditary or constitutionally predisposing. A cold was contracted in the early part of May, giving the ordinary symptoms; but from that cold I theorized a conclusion, to wit: there having been, for a time previous, developments indicating the near approach of puberty, and the uterus and ovaries being in the irritable and sensitive condition present at the change of life, received the impulse of that cold—result, an abnormal development into a diseased action in place of the normal development from girlhood to maidenhood. But this would not explain the fatty degeneration of the liver. Was there something in the causes on which we were unable to place a finger? Was there any connection between the origin of the fibrous tumor and the fatty liver? Or was the existence of the two in the same patient at the same time, merely a coincidence. Which of the two pathological conditions had preference in point of inception?

Points in this case worthy of attention are: the absence of all tenderness over the tumor; the very little pain arising from it; the existence of the fatty liver at the same time, and the age of the patient. On the latter point I have not heard or read of any cases at so early an age, and before puberty.

ARTICLE XXVI.

THE MODEL PHYSICIAN.

Address before the New Haven County Meeting, April, 1858.

BY ALVAN TALCOTT, M.D., OF GUILFORD.

Gentlemen:—

I propose to occupy your attention for a few minutes, in sketching the outlines of the Model Physician.

I shall not dwell upon the importance of his being well trained in the ground work of the profession. Without a thorough knowledge of the fundamental branches, acquired by diligent study in early life, and refreshed by frequent review as years pass on, the professional character will be radically defective. One must, of course, thoroughly master the alphabet of science, before advancing to the higher walks of mental culture. Passing by these points, so obvious that their importance is at once admitted, I proceed to mention some points and traits of character which are essential for the attainment of the highest professional excellence.

An element, vitally important in the character of the perfect physician, is true Christian principle. Every life is a failure in many important respects, even in a worldly point of view, that is not inspired, guided and directed by sincere religious principle. The aspiration to a higher life makes a better citizen and a better man. In no employment or profession is this more strictly true than in ours. The duties of the physician are many of them so laborious, so repulsive, so unappreciated, his most successful efforts are so often requited with misrepresentation, ingratitude, or abuse, that he needs the inspiring aid of high Christian principle to carry him on to the performance of his full professional duty. He is brought in contact with human nature in its manifold phases. He treats diseases resulting from the providence of God, or from the ignorance, folly or depravity of man—diseases moral, mental, and

physical—arising from perverted moral faculties, from bodily excesses, from disordered and overstrained nerves, from depraved appetite, from unrestrained passion, and from the thousand causes, avoidable or inevitable, that fill the world with sickness, infirmity and death. If all the members of society were constantly under the influence of a well trained mind and high moral principle, many of these disorders would be essentially modified or prevented altogether. And no one can exert so commanding an influence in this respect as the physician whose upright life and high Christian character give point and effect to the maxims of truth and duty that fall from his lips.

The model physician must always be ready to learn. Our knowledge of the principles and practices pertaining to our profession, is, in the case of the wisest of us, not yet complete. We have still much to learn. New truths are from time to time presented, and new remedies and modes of treatment proposed. These require careful examination, but are not to be taken on trust. All that is truly useful should be adopted, not because it is new, or because it is fashionable with the profession or with the public, but because it is a real improvement.

The model physician will be a gentleman. He will respect himself, and in so doing manifest a proper respect for all with whom he is called to associate. True politeness is kindliness of heart, kindly expressed, and the physician, of all men, will never lack occasion for its exercise. Frank in his bearing, even in his temper, easy in his manners, refined in his tastes, affable to his friends, forgiving to his enemies, if he has such, with an ear ever closed to the tale of slander, but ever open to the cry of distress, ready to render the best professional advice and assistance, equally to high and low, to rich and poor, to virtuous and vicious—always keeping family secrets and professional confidences hermetically sealed, sympathizing warmly with the suffering, and persevering and self-denying in his efforts to grant relief—liberal to the poor and no worshiper of money,—with a heart to feel, a head to plan, and a hand to execute,—unable to descend to the low arts of duplicity, deception and intrigue, and in all the conduct of life doing to others as he would that they should do to him,—in the persistent exercise of such traits he shows himself the true gentleman as well as the good physician.

He will be a leader in all measures that will promote the public health. A large percentage of the diseases that afflict the race,

can, as we know, be greatly modified or wholly prevented; and he will be ever ready to suggest, and active to carry out, the measures that are requisite for this result.

He will ever be on the right side in every good work, not a partisan, not an active politician, but always reliable, and always on hand to promote and sustain any measure that will advance the intellectual, moral or physical interests of the community.

But, however well qualified, morally, intellectually and practically, the physician may be, he must not expect to be properly appreciated. He must be prepared to meet with misrepresentation and censure. His most carefully and skillfully conducted cases will be criticised by those who have not the first requisite qualification for forming a correct judgment. And if a case terminates fatally, as many of the best managed cases must and will, the result is ascribed to lack of skill in the physician, rather than to the providence of God. He must expect, also, to encounter unreasonable prejudices, and unfounded charges. He will be accused of being proud, or avaricious, or indolent, or intemperate, or an opium-eater, and although the charge is unanswerably proved to be false and groundless, still the slander has gone forth and gets the start, and it is next to a miracle if the truth ever overtakes it. But, if he is actuated and guided by the higher motives to which I have alluded, he will proceed calmly on his way, using all his efforts to alleviate human suffering, and promote human happiness; and in the consciousness that he has faithfully fulfilled his duties to himself, his fellow-men, and his God, he will receive an ample reward.

MEMOIR OF

PROF. WORTHINGTON HOOKER, M.D.,

OF NEW HAVEN.

Read before the New Haven County Society

BY HENRY BRONSON, M.D., OF NEW HAVEN.

Worthington Hooker was a lineal descendant of the Rev. Thomas Hooker, the leader of the first colony of planters which settled in Hartford, Conn., in 1636. He was the youngest son, save one, of John Hooker, known as Judge Hooker, (a man of high christian character, and much respected,) of Springfield, Mass., and was born March 2nd, 1806. His mother was Sarah Dwight, of the same town. He entered Yale College (says his tutor, President Woolsey) "a blameless youth," and "was one of the best scholars of his class." Even then he was distinguished as "an easy writer, and produced some fine compositions." He graduated, with high honor, in 1825. Choosing Medicine for a profession, he went to Philadelphia to pursue his studies. Afterward, he attended lectures in Boston where he received the Boylston prize—a case of surgical instruments—for a medical essay. (In the latter years of his life, he presented a similar prize to some member of each of his own graduating classes for the best anatomical preparation.) He received the degree of M.D., from Harvard College in 1828. Soon after, he accepted an invitation to settle in Norwich, Conn., where, ere long, he gained a wide reputation, and an extensive practice. Here he remained for twenty-three years, devoting himself zealously and faithfully to his profession, a much beloved and highly respected physician.

In May, 1844, by appointment, Dr. Hooker read before the Convention of the Connecticut Medical Society the annual dissertation bearing this title: "On the Respect due to the Medical Profession, and the Reasons that it is not awarded by the Community." It was published with the "Proceedings," making twenty-four pages, and is, we believe, the first of the author's printed productions.

It is an earnest and able protest against public opinion on the one hand, and the delinquencies of the faculty on the other. The topics of this essay were afterward embraced in a more comprehensive work of 422 duodecimo pages, published in 1849, and entitled "Physician and Patient"—a book which secured for the writer a high rank as a literary man, and medical scholar. At later dates he wrote several other articles which appeared among the papers of the Connecticut Medical Society.

In 1850 Dr. Hooker was the successful competitor for the Prize Fund Dissertation of Rhode Island, his essay being entitled "Lessons from the History of Medical Delusions," 105 pages, octavo. The questions discussed are handled in a skillful and instructive manner. As chairman of one of the important standing committees of the American Medical Association which met in Charleston, S. C., in 1851, he composed and read a report on Medical Education which won for him many laurels. As chairman of another committee, he made a report on "Demonstrative Midwifery," in which certain exciting questions and novel practices came up for consideration, and which contributed much to harmonize previously divergent opinions and feelings. He took an active part in the Convention, on this and other occasions, and in more than one instance was considered the most influential man in it. In 1854 he was chosen the Vice President of the Association.

In 1852 a vacancy happened in the Medical Institution of Yale College, and Dr. Hooker was appointed to a professorship. Preferring the department of Theory and Practice, Prof. Ives exchanged his place for the vacant chair of Materia Medica, and Dr. Hooker was installed as his successor. His inaugural address, styled "The present Mental Attitude and Tendencies of the Medical Profession," was delivered in the College Chapel, and published. It has decided merit.

The next year Dr. Hooker published "Human Physiology," a duodecimo volume of 424 pages, designed for colleges and the higher schools. It was the first of his series of books intended to popularize the natural sciences. It was a reputable performance, and profitable to the publishers. This was followed by the Child's Book of Nature, in three parts, 1857; the Child's Book of Common Things, 1858; Natural History, 1860; First Book of Chemistry, 1862; Natural Philosophy, 1863; Chemistry, 1863; Mineralogy and Geology, 1865; all for the use of schools and families. The series became widely known, while some of the volumes, particularly

the Child's Book of Nature and Natural History, had (and still have) an extensive sale. It is gratifying to know that the author's labors for the diffusion of science in its familiar forms were, in the end, highly remunerative.

Dr. Hooker's success in the difficult work of simplifying and unfolding scientific truth, and communicating it, in an intelligible and attractive form to the minds of children, was conspicuous, a friend says, marvelous. He succeeded in doing what men of original research and extensive acquirements have, as a general rule, failed to do. His manner is familiar and inviting, and his style simple, clear ("transparent as air," says a critical notice) and pleasing. Thousands have received the benefit of his labor, and many letters of grateful acknowledgment (from mothers, teachers and others) from all parts of the country and from distant lands, many of them overflowing with compliments, were received by him. He was fond of children, made himself familiar with their mental growth and progress, and the laws of their development; entered into their feelings, saw with their eyes, and apprehended with their faculties, and thus was able to adapt himself to their natures, to gain admission to their minds, and to lodge and make fast there the facts and ideas he would communicate. We risk little in saying that his books of elementary science were, on the whole, better than any which preceded them. In the school books he provided, he carried out his views of what education ought to be. He thought the simple facts of science should be taught as one of the elementary branches. Children are curious, inquisitive, fond of nature, and eager to know "things." These natural desires, which cannot and should not be repressed, he proposed to encourage and direct. By supplying the young mind with the food it craves—its proper nourishment—health and growth are ensured.

Though Dr. Hooker was so busy in the preparation of educational works, he did not neglect his profession. He continued his moderately increasing practice, till, determining to break away and prolong go with his family to Europe, he sought it no longer. Nor did he at any time neglect to use his pen in behalf of professional interests. He wrote an essay on "Rational Therapeutics," &c., which obtained the prize of $100 offered by the Massachusetts Medical Society, and which was published in 1857, making 68 pages. It is one of the best of his medical writings, which, by the way, on the score of merit, have considerable uniformity. On one occasion (1866), with a higher aim than was his

went, he read before the Connecticut Academy of Arts and Sciences, a scientific paper entitled "Man an original Creation, not a development, as taught by Darwin and Huxley." It was printed in the "Theological Eclectic" of Cincinnati, making 20 pages. Judged by the standard of science, it is not quite up to the level of the subject. He also wrote for the medical periodical press, and was a frequent contributor in the review department to the pages of The American Journal of the Medical Sciences. The last writing he ever did was for this Journal. It was a review of Maudsley's Physiology and Pathology of the Mind. His work was broken off by the illness which, four days afterward, terminated his life. The paper closes with this sentence: "There are many other parts and points of this author which we had intended to touch upon, but sickness has cut our duties short."

For the literary and religious newspapers and magazines, Dr. Hooker wrote frequently. He furnished articles for the New Englander, the Boston Congregationalist, The Little Corporal, a child's paper published in Chicago, (these last he signed "Uncle Worthy,") Harper's Magazine and Harper's Weekly, generally on topics relating to his profession, and admitting of popular discussion. For Harper's Weekly, he prepared in all forty-six papers, the last appearing November second, 1867. Few men have excelled him in the power of presenting medical truth to common minds intelligibly—presenting it in an acceptable form, and unexceptionable manner. Most of those who have written in the same line have been in some way imperfectly qualified, without practical knowledge, superficial, erratic in their opinions, and deficient in common sense. Hence they have often done more harm than good, administering to a vague curiosity, without imparting definite views or trustworthy knowledge.

Notwithstanding his multiplied literary labors, Dr. Hooker did not forget his other duties. He lectured to his pupils five or six days in the week during term-time; heard private medical recitations throughout the year; attended to his patients; was a director of the "Hospital Society," and one of its physicians; became a deacon in the church to which he belonged; was a participant in the business proceedings of temperance and other societies; was a regular attendant and active member of the different medical associations, and prompt, zealous and faithful in whatever he undertook. He was an industrious man, always had some special work in hand, and loved to labor. Methodical and orderly in

everything, he performed whatever task was before him expeditiously and well. Nor did his efforts exhaust him. He was one of the easiest of workers. His thoughts flowed from his pen almost without an effort—so quietly, and with so little exertion and excitement, that he could write far into the night and sleep soundly afterward. His compositions in many cases give internal evidence that they were written *currente calamo*. Some of his medical essays, however, are more labored, and must have made larger drafts on the vital forces.

Dr. Hooker could not be considered a profound, or very learned man. He was not a hard thinker, or original observer. He did not give sufficient attention to any particular branch of science to make himself a proficient. In his latter years, he studied that he might write books—good books. His volumes on education were compiled, but are not the worse for that. It requires skill and tact and talent to select the best—to assort, arrange and set forth impressively. Men have different gifts, and no one has them all. Dr. Hooker was eminent in his way, and a distinguished member of a liberal profession. Few—few even of those called men of genius—can boast of labors more useful.

Dr. Hooker's spoken resembled his written speech. He was ready and fluent, but lacked concentration and terseness of expression. The art of *pointing* thought was not his. In his lectures he seldom employed notes, or used them sparingly, thinking he could teach better by extemporaneous performance. In discourse, as well as in his essays, he was practical, earnest, emphatic, but not eloquent.

Our friend was of medium stature, well rounded and portly in form, with an open, cheerful countenance, a gracefully turned and well developed head, thin gray locks, and fine "presence." In manners he was agreeable, of society fond; was social, genial, sometimes mirthful; hopeful in temperament, and confident in his bearing, while his face was all the time beaming with contentment. He was fond of approbation, and liked to talk about his books, the views he had set forth, his plans for the future, and the work he intended to do.

The fever which brought to a close Dr. Hooker's life, Nov. 6th, 1867, came on insidiously, almost unsuspected by himself. At first it did not interrupt his labors with the pen. "I am playing ill a little," said he to a female friend who had called to see him, "only a trifle unwell—a good time to work;" and work he did,

almost to the last. The editor of the American Journal appends to the closing effort of his life the following remark: "* * * * This is not the place to give expression to our grief at the irreparable loss which the profession and the whole community, no less than ourselves, have sustained, or to dwell on the virtues of the deceased, his great abilities, and the useful purposes to which he devoted them."

The first wife of Dr. Hooker—formerly Miss Ingersoll, of Springfield, Mass.,—died soon after his removal to New Haven. His second wife, (a daughter of the late Gov. Edwards, and great-grand-daughter of President Edwards,) and a son of twelve years of age, still survive.

MEMOIR OF

WILLIAM B. CASEY, M.D.,

OF MIDDLETOWN.

Read before the Middlesex County Society.

BY E. R. SYE, M.D., OF MIDDLETOWN.

William Bryan Casey, seventh son of James and Susan C. Casey, was born in the city of Middletown, Ct., Dec. 28, 1815. He seems to have enjoyed good early educational advantages, as soon after the death of his father in 1822 he was sent to a school in Jamaica, L. I. Leaving there after four years, on account of intermittent fever, he was sent to Morristown, N. J., and to schools in his native State until he entered the grammar school, and subsequently the collegiate department of Columbia College, N. Y., where he was graduated A.B. in 1834.

He received the degree of M.D. at the University of Pennsylvania, in March, 1837, and while attending the lectures of that institution was a pupil of the late Dr. Samuel G. Morton. Having, previous to his graduation, entered the Bellevue Hospital Alms House, he returned to that institution where at the time ship fever was extensively prevalent.

He was married in Nov. 1837 to Miss Cornelia M. Beare, of N. Y., who bore him eight children, three of whom died in early childhood.

After his marriage, he was attached to the N. Y. Dispensary, N. Y. Lying-in Asylum, and Broome St. Infirmary, until Sept. 1839, when he removed to his native city, where, both as physician and citizen, he soon won the confidence of the community; a confidence which was increased with each succeeding year. For a time during his residence here—from about 1850 to 1854—besides discharging the duties of his profession, he was proprietor and editor of a weekly, and for a season, a daily newspaper. The life of this paper, though short, was in all respects an honorable one. It is largely to its influence that the public are indebted for improvements they are now enjoying.

Through the unsolicited suffrages of his fellow-citizens he was twice elected mayor.

Having been called to mourn the loss of his wife in the spring of 1852, he was united in marriage to Miss Margaret M. DeKoven of Middletown, Oct. 5, 1854.

Although up to within some months of his death he had the appearance of health, he was not in the enjoyment of it. During most of his professional life he was subject to an intestinal irritability which made almost daily medication necessary. As he was less subject to this when near the sea, in the fall of 1860 he removed to the city of New York. While there he was for a time one of the attending physicians of St. Luke's Hospital. He subsequently removed to East Haven, Ct.

On the breaking out of the Rebellion, he entered the service of his country as surgeon of the 20th Regt. C. V. During one year of the time he was with the army, he filled the position of Brigade Surgeon. He was afterwards Ass. Surgeon of the Knight Hospital in New Haven. He was also charged with the duty of organizing a government hospital at Montpelier, Vt.

Soon after leaving the service of the government, he again became a resident of his native city. It was while in the service that, in his opinion, the foundation was laid for that disease which was to terminate his life—diabetes mellitus. Although a prey to this formidable and inveterate affection, he pursued the practice of his profession more or less until the fall of 1869. For many months previous to his decease, it was his lot to suffer much. Owing to idiosyncracies he obtained comparatively little relief in the way of soporific or anodyne from the resources of the art he had so often and so successfully applied for the relief of others. During the last few weeks of his life, however, he suffered less, being in a comatose condition, alternating with delirium. He died without a struggle on the night of March 28th, 1870.

In the death of Dr. Casey, both our profession and society have sustained more than a common loss. To a physique endued with more of the graces than are commonly allotted to any one man, united with a courtly yet affable manner, were added the higher qualities of a well-cultivated, well-stored and practical mind. Of course such a man would secure the respect and confidence of a community in any relation, and especially that of a physician. This was emphatically true in the case of Dr. Casey. He had good perceptive faculties, a ready yet clear judgment, was always famil-

imbued with disease both by reading and observation, so that he would quickly apprehend the significance and bearing of the symptoms of a case, and fix upon a proper plan of treatment. The adaptation of remedies to the peculiarities of a case seemed in him to be almost an intuition. While in mild cases of acute disease, he depended much on the *vis medicatrix naturæ*, he had strong faith in the virtues of the materia medica when judiciously employed, and in the graver cases, prescribed in doses decidedly efficient. In those emergencies so trying to nerve and courage which every practitioner must encounter, he was, as always, gentle, urbane, and self-possessed in manner; prompt and vigorous in action. None better than he illustrated the *suaviter in modo, fortiter in re*. During that part of his professional life which was spent in his native city, he had an extensive practice. Probably the history of our county affords no instance of one of no greater age who was so frequently called in consultation. And by none were his counsels more frequently sought, nor more highly prized than by his professional brethren, which, it may be stated without incurring a charge of professional egotism, is evidence of good ground for the estimate in which his services were held by the public. Although in every community there are those who will receive with more implicit faith the drivel of a quack than a well considered judgment, it was comparatively seldom that the correctness of his professional opinion was called in question. There was that about him which, without effort on his part to secure it, commanded confidence.

His resources were always at command. Conscious of his ability, he had the will to do whenever duty called. On his way from Philadelphia where he had but just received his diploma, a fellow passenger had the misfortune to dislocate his shoulder. The Doctor, scarcely out of his minority, a stranger, and so far as experience was concerned, a novice, reduced the dislocation. Those well acquainted with him would be disposed to say it was just like the Doctor to do it, and do it well. During his residence in East Haven he was called upon to deliver at very short notice, a series of lectures on obstetrics to the students of the Yale Medical School. They were delivered, and were well received by the class.

He had an unusual versatility of talent. Seldom is it that one who so excelled in any one department should so excel in all. It may be stated as exhibiting in a still clearer light one of his characteristics, that both before and after his service under the govern-

ment, with a large general practice, he performed much and difficult surgery, although he had a decided dislike for it. Had his abilities been devoted to the cultivation of any one department of the profession, there can be no doubt he would have secured a pre-eminent position.

Dr. Casey, from a native refinement as well as from culture, had a taste for the æsthetical. While he kept himself well-informed on all matters relating to his profession, he enjoyed the hours devoted to the literature of the day; and few, having as much practice, read as much. He was a ready and not ungraceful writer. He occasionally published an article on medical subjects, all of which both as to matter and manner were creditable.

In his professional intercourse with his brethren he was honorable, and those who knew him most intimately confided in him most implicitly. Although he would have been quick to resent an insult, under less provocations, he would bear much and forbear long for the sake of peace. He was quick to detect, and enjoyed much the humorous side of a subject, yet never at the expense of his dignity. He was of an unusually cheerful temperament, which inured to the comfort of his patients; and it was rare he did not leave them feeling better than he found them, however hopeless their cases.

As a husband, he was devoted and affectionate; as a father, kind and indulgent; as a citizen, liberal in his views and action. Few of so much independence and decision of character have, at death, left so many friends; so few enemies. It is not too much to say that the death of no one in the city where he resided, could have caused such general regret. At his death, he was a trustee of the General Hospital for the Insane for the State of Connecticut.

Dr. Casey died a Christian. Surrounded by an affectionate and devoted family; beloved by many and respected by all of the community; but little past middle age; of a nature susceptible of high enjoyments; and master of a profession which he loved, with good health, he could have looked forward with hope to years of usefulness and happiness. To abandon so much calculated to attach him to life, could not but cost him a struggle, yet he was enabled to make the surrender, and to exemplify on his death-bed the consolations and the graces of the Christian. Called, as he was, for months, to pass almost uninterruptedly, wearisome days and sleepless nights, scarcely a murmur escaped him. When not comatose or delirious, he joined with interest in prayers offered at

his bedside, and enjoyed a contemplation of the promises of the Savior of men to such as put their trust in him. He had been for years a communicant in, and at the time of his death was senior warden of, the church of the Holy Trinity in Middletown.

Such was Dr. Casey; and while we mourn the absence of him who contributed so largely to the pleasure and interest of our annual reunions, we may, I think, find cause for thankfulness that he was permitted to live so long to give dignity and honor to our profession. Though we sorrow that he has left us, in respect of those essentials without which he would not have been man, we can believe that he still lives. Though the casket be destroyed, the jewel it contained is not. Though he be dead, we may remember it is the fiat of the Beneficent Creator that only through death shall the life eternal be attained.

MEMOIR OF

DANIEL SHELDON, M.D.,

OF WASHINGTON.

Read before the Litchfield County Society, April, 1858.

BY S. W. GOLD, M.D., OF WEST CORNWALL.

Dr. Daniel Sheldon was born Oct. 19th, O. S., 1750, at Hartford. His parents were pious and respectable, who intended him for the Ministry, but acquiesced in the choice he expressed for the medical profession. Like most of the young men of that day he devoted a part of his time to agricultural toils and a part to classical studies, in winter attending the Grammar School, and in summer working on the farm. He acquired a knowledge of the Latin and Greek languages. At the age of seventeen he came to study medicine with Dr. Bird, then living in Litchfield South Farms. When he had completed his studies he went to reside at Washington, Conn. In 1777 he was married to Charlotte Judson of that place. She died about 1782. He married for his second wife, Hulda Stone of Litchfield, by whom he had four children. A circumstance which occurred in his own case early directed his attention to the treatment of cases of consumption. In consequence of leaving off his flannel too early in the spring, a bad cold was produced which resulted in the formation of an ulcer in his lungs, which reduced him to hopeless ill health. He kept on attending to his practice, riding on horseback daily in all weather. He also to quiet his cough took opium so largely as to injure his health. He then left off the habit entirely.

Dr. Sheldon was strictly temperate. He was instrumental in forming a temperance society as early as 1785, before these things were generally thought of. Dr. Sheldon began life poor, but in old age was abundantly supplied with means for his comfort, furnished by his children.

Dr. Daniel Sheldon was a professor of christianity and united with the church in Litchfield. He was widely known not only throughout the county of Litchfield as a distinguished physician, but in distant parts of the State. He was esteemed by his personal friends not less as a Christian gentleman than a worthy citizen. The writer having enjoyed the pleasure of professional acquaintance for some thirty years, will speak from his own knowledge of his many virtues as a man and physician.

He possessed naturally a superior order of intellect, which was enriched by culture, not only by reading but by extensive experience in his profession. For more than forty years he stood at the head of the profession as consulting physician in this county.

Dr. Sheldon was discriminating and thorough in the examination of his patients, ready and scientific in his prescriptions, which were always written in a neat and plain manner. He abhorred quackery of every form. He treated his brethren in the profession with courtesy and respect. With all his superiority, modesty was a marked feature of his character. He was distinguished for simplicity and caution in the use of remedial means. This he inculcated on the minds of the younger members of the profession, until at length this became general throughout the county. For a time Dr. Sheldon received students in his office. Among those who studied with him were Dr. Warren Fowler, late of Washington, and Dr. Lyman of Torrington, both eminent members of the profession.

Dr. Sheldon retained much of his natural activity in his old age. When he was eighty he rode on horseback to visit a patient in Goshen, six miles from his home, and returned the next day in the same manner. Perhaps of few men who have attained to the same longevity as did Dr. S. would it be said that he enjoyed a happy old age.

During some of the last years of his life, Dr. Sheldon lived in the family of his daughter, where he received every attention which affectionate children could bestow. With a bright hope of a glorious immortality, he died on Friday, April 10th, 1840, leaving to the profession the rich legacy of his many virtues for our imitation.

MEMOIR OF

SAMUEL W. GOLD, M.D.,

OF WEST CORNWALL.

Read before the Litchfield County Society.

BY H. M. KNIGHT, M.D., OF LAKEVILLE.

Dr. Samuel W. Gold died at Cornwall, Sept. 10th, 1862, in the 75th year of his age. Born in this county, and having spent his long and useful life in it, with the exception of the first three years of his medical practice, he was widely known, and universally esteemed. Dr. Gold had retired from the more active duties of his profession, before my acquaintance with him began; but he never lost his interest in the chosen work of his life, even after the establishment of the somewhat famous "Cream Hill School" for boys. He did not lose his interest in the younger members of the profession. He was fond of speaking of the advantages possessed by young men of the present day, in obtaining a thorough education, over the students of fifty years ago, and of urging high aims and large endeavors. I am informed that he was a successful practitioner, always entering the room of a sick person with a cheerful countenance, and a manner calculated to inspire confidence. He highly estimated his profession, and was exceedingly jealous for its honor.

Dr. Gold, a descendant of one of the earliest Congregational ministers of the town, was born in Cornwall Sept. 27, 1794. He graduated at Williams College in 1814. He attended medical lectures in New Haven, was licensed in 1816, and commenced the practice of medicine in Madison, New York, the same year, where he remained three years. In 1819 he returned to Cornwall, where he remained five years. In 1824 he removed to Goshen, where he continued in active practice eighteen years, until 1842, when he again returned to Cornwall. He received his degree of M.D. from Yale College in 1836.

In 1843 the "Cream Hill School" was opened, with which he was connected until 1867. At that time, the infirmities of age compelled him to cease from every form of active labor.

Dr. Gold was a man of strong will; if convinced that a certain course of procedure was right, he could not be swerved from it; yet he was neither obstinate or overbearing in accomplishing his purposes. He was not only a man of firmness, but a man of strict integrity. His word was worth as much as his bond. All of his acquaintance knew they might rely upon the fulfilment of any promise he made, and he made this confidence in him a power for doing good. Whoever came to him for advice was sure to find sympathy, and to receive wise counsel or assistance. He was a Christian. For about a quarter of a century he had been a member of the Congregational church in North Cornwall; and during that time had identified himself with God's professing people not only in name but by earnest Christian labors.

Dr. Gold was a man of public spirit. He interested himself in all improvements; he did not hesitate to recognize progress either in his profession, in the arts and sciences, or in agriculture. For an old man, he was remarkably young, keeping up with the times, until within two or three years of the close of his life, when his mental and physical power failed somewhat.

He was fervently patriotic. During the late war, his anxiety for the country was intense, and his ardor almost youthful. In 1865 he was connected with the Christian Commission, and was in Washington at the time of the assassination of President Lincoln. The political honors conferred upon him show the public confidence in him. He was elected to the State Senate in 1848, and again in 1859. He was also Presidential elector in 1856. Dr. Gold was married to Miss Phebe Cleaveland, of Madison, New York, in 1817. She survived him a few months.

The death of Dr. Gold was sudden though not altogether unexpected. He arose in the early morning in his usual health, and while walking nearly in front of his house, fell, and when found was dead.

MEMOIR OF

EARL SWIFT, M.D.,

OF MANSFIELD.

Read before the Tolland County Society.

BY O. B. GRIGGS, M.D., OF MANSFIELD CENTRE.

Earl Swift, M.D., was born in Mansfield, Conn., April 8th, 1784, and died in his native town June 14th, 1869, in the 86th year of his age. His father, Barzillai Swift, was one of the largest landholders, and one of the wealthiest farmers in the town, and his son Earl remained at home, performing the usual duties of farmers' boys, and attending the district school until he was sixteen years old, when, having manifested a decided taste for study, and having an ardent desire for a liberal education, he was placed under the care of the Rev. John Sherman, then pastor of the Congregational church in South Mansfield for the purpose of being fitted for college. He made rapid progress in his studies, and in less than two years was prepared to enter the sophomore class of Yale College. He graduated at Yale in 1806, and soon after commenced the study of medicine; at first in the office of his brother-in-law, Dr. Jabez Adams of South Mansfield, with whom he remained about two years, and afterwards in the office of Dr. Joseph Palmer of Ashford, continuing with him until the close of his studies.

He attended medical lectures at Cambridge, and was licensed to practice in May, 1808. The same year he commenced the practice of his profession at Windham, Ct., where he became acquainted with Miss Laura Ripley, daughter of Ralph Ripley, Esq., of that town, and a sister of the late Gen. J. W. Ripley of Hartford. They were married April 10th, 1810, and the following year removed to Wethersfield, Ct., where he practiced medicine two years. At the earnest solicitation of his brother-in-law, Dr. Adams, he then removed from Wethersfield to his native town, where he resided until his death. On his return from Wethersfield he en-

tered into partnership, in the practice of medicine, with Dr. Adams, which continued thirty-five years, and until the decease of Dr. Adams. During all this time the most amicable relations existed between the partners, although the benefits of the copartnership were generally supposed to be decidedly in favor of Dr. Adams.

Dr. Swift did not belong to the *heroic* school of practitioners, and he had not that confident self-reliance, to which it would seem, from his thorough literary and medical education and high order of intellect, he was justly entitled; but this was probably owing to his being very unfavorably situated for the cultivation or growth of self-confidence as a practitioner, having a partner much older than himself, who was considered a very skillful physician, and upon whom he accustomed himself too much to rely in all cases of doubt or difficulty. In his intercourse with his neighboring medical brethren he was frank, cordial and friendly, and always observed toward them the strictest rules of professional etiquette.

He continued in the active practice of medicine for nearly sixty years, and wholly relinquished practice only about one year previous to his decease. He had a large practice, and was very skillful and successful as a physician; a man of sound, discriminating mind and good judgment, and eminently a safe counselor, and enjoyed more than most physicians the confidence of his patients and of the community; and being of a genial, social nature, and an accomplished gentleman, his presence was always welcome, either in the festive gathering or in the sick room.

Dr. Swift was ardently devoted to his profession, and always cheerfully responded to his numerous calls, but was very inefficient in the collection of his bills, and only as necessity required, presented them for payment; and this, combined with the demands upon him for the support of a large family, prevented his accumulating much property, for which, indeed, he never seemed to have any desire, and he died poor in this world's goods; yet he left the richest legacy which any man can leave to the world, a family of well-trained, well-educated and highly respectable children, and an example above reproach or suspicion. He had ten children, eight of whom, four sons and four daughters, survive him. His widow died April 17th, 1870, aged seventy-eight years. Early in life he made a profession of religion, and united with the Congregational church in his native parish and continued a worthy and consistent member thereof until his death. He passed away quietly in the bosom of his family, full of years, honored and respected by all who knew him.

MEMOIR OF

RUFUS BLAKEMAN, M.D.,

OF GREENFIELD.

BY GEORGE L. SEERS, M.D., OF BRIDGEPORT.

Dr. Rufus Blakeman was born in Monroe, Fairfield county, in 1795. He was one of eleven brothers and sisters, two of whom survived him. He was prepared for college at Easton Academy, was graduated from Union College in 1819, and received his medical education in New York. In 1822 he went to Greenfield, in his own county, and commenced practice. Here he remained discharging faithfully the duties of his profession till last summer.

In November last, Dr. Blakeman lost his appetite and digestion, and from that time gradually declined, retaining, however the full possession of his faculties to the last. His death occurred February 27th, 1870. He was greatly respected and much lamented by the people among whom he had lived and practiced for nearly half a century.

A thorough education, superior talents, extensive reading and much reflection, qualified Dr. Blakeman for eminence in his profession. Besides attending faithfully to his patients, he found leisure to write a book entitled "A Philosophical Essay on Credulity and Superstition," a duodecimo volume of 206 pages, which was published in 1849. He was greatly esteemed by his medical brethren, was often a Fellow of the Connecticut Medical society, and for several years was a member of the "Committee of Examination." In 1849 he was chosen Vice President of the society, and in 1851 President, holding office in each case two years. He was also honored in civil life; represented the town of Fairfield in the Legislature, and for several years was the Judge of Probate in his district, discharging the duties of the office with ability and acceptance.

Νεκρολογια

De Mortuis nil nisi bonum

PROF. WORTHINGTON HOOKER, A.M., M.D.

Born at Springfield, Mass.,	March 31, 1806
Graduated at Yale College,	1825
Received the degree of M.D. from Harvard College,	1829
Practiced in Norwich, Conn.,	1829–1832
Professor of Theory and Practice of Medicine, in Yale College,	1832–1847
An author of numerous Essays on Professional subjects and of books on the Natural Sciences	
Vice President of the American Medical Association,	1864
Died at New Haven,	Nov. 4th, 1867

CHESTER STUT, M.D.

Born in Colchester, Conn.,	Feb. 1807, 1808
Licensed to Practice by the Conn. Med. Soc.,	1831
Received the degree of M.D. from Yale College,	1837
Practiced in Middletown, Conn.,	1831–1868
Died at Windham, Conn.,	Aug. 1865, 1868

ISRAEL W. OGDEN, A.M., M.D.

Born in Cornwall, Conn.,	Sept. 1775, 1776
Graduated at Williams College,	1814
Licensed to Practice Medicine by Conn. Med. Soc.,	1816
Received the degree of M.D. from Yale College,	1826
Practiced in Madison, N. Y.,	1816–1821
Practiced in Cornwall, Conn.,	1821–1841
Practiced in Windsor, Conn.,	1841–1842
Returned to Cornwall,	1842
Elected to the State Senate,	1844, 1845
A Presidential Elector,	1856
Died at Cornwall,	Sept. 26th, 1867

Pallida pauperum
Mors aequo tabernas
pulsat regumque
pede turres.

Νεκρολογια

De Mortuis nil nisi bonum

Pallida Mors aequo pulsat pede pauperum tabernas regumque turres.

EZEL WRIGHT, A.M., M.D.

Born in Mansfield, Conn.,	April 8th, 1734
Graduated at Yale College,	1763
Licensed to Practice Medicine at Cambridge, Mass.,	1768
Received the degree of M.D. from Yale College,	1770
Practiced at Windham, Conn.,	1768–1781
Practiced at Northfield, Conn.,	1781–1817
Practiced at Mansfield, Conn.,	1817–1819
Died at Mansfield, Conn., (See address below.)	June 18th, 1819

JOEL B. HYDE, A.B., M.D.

Born at Coventry, Conn.,	July 24, 1801
Received the degree of M.D. at Pittsfield, Mass.,	
Practiced Medicine in Marlborough, Hebron and North Mansfield, Conn.,	
Surgeon in U. S. Army,	1832–1836
Died at Coventry, Conn.,	June 12th, 1839

SETH BLAKEMAN, A.M., M.D.

Born in Monroe, Conn.,	1795
Graduated at Yale College,	1819
Received his Medical education in New York,	
Practiced in Stratfield, Conn.,	1821–1824
Professor of Conn. Medical Society,	1824–1832
Died at Greenfield,	Feb. 29th, 1832

NATHANIEL HEAD PERRINE, A.B., M.D.

Born at New London, Conn.,	Feb. 11th, 1795
Graduated at Yale College,	1812
Attended Medical Lectures at Univ. Penn.,	
Received the degree of M.D. at Yale College,	1818
Practiced Medicine in New London,	1815–1870
Died at New London,	May 19th, 1870

Νεκρολογια

De Mortuis nil nisi bonum

Pallida Mors aequo pulsat pede

pauperum tabernas regumque turres.

ELISHA K. KANE, A.B., M.D.

Born at Chestertown, Md., Dec. 1820, 1798
Visited Mediterranean, 1837
Graduated in Philadelphia, Penn., 1842
Received the degree of M.D. from Yale College, 1843
During the War of 1847, he was Surgeon in the Army
Practised Medicine in Preston, Conn., 1843-1850
Died at Preston City, Feb. 1857, 1858

WM. BRYAN CARPI, A.B., M.D.

Born at Middletown, Conn. Dec. 1805, 1781
Graduated at Columbia College, N. Y., 1823
Received the degree of M.D. from the Univ. of Penn., 1827
Attached to the N. Y. Hospital, N. Y. Lying-in Asylum, and Bloomingdale Insane Asylum, 1827-1829
Practised in Middletown, 1829-1840
Attending Physician at St. Luke's Hospital, N. Y., 1840
Held several important positions as Surgeon during the war of the Revolution, 1807-1812
Lectured on Obstetrics at Medical Inst. Yale College, 1812-1813
Returned to Middletown, 1813
Died at Middletown, March 26th, 1853

CHARLES WOODRUFF, A.B., M.D.

Born at Farmington, Conn., 1780
Licensed to Practice Medicine by Conn. Med. Soc., 1803
Received the degree of M.D. from Yale College, 1807
Practised Medicine at Wethersfield, 1804-1813
Practised at Windsor, 1813-1815
Practised at Middletown, 1815-1854
Died at Middletown, May 18th, 1854

Νεκρολογια

De Mortuis nil nisi bonum

NATHAN SMITH TYLER, A.B., M.D.

Born at New Haven, Conn.,	June 6th, 1806
Graduated at Yale College,	1825
Received the degree of M.D. from Yale College,	1828
Practiced in New Haven,	1828–1865
President of Conn. Medical Society,	1865
Died at New Haven,	June 26th, 1865

SAMUEL PENDLETON, A.B., M.D.

Born in New Haven, Conn.,	Jan. 31st, 1791
Graduated at Yale College,	1811
Licentiate to practice Medicine by Conn. Med. Soc.,	1813
Received the degree of M.D. from Yale College,	1814
Practiced in New Haven,	1811–1851
Died at New Haven,	March 29th, 1851

LUCIUS ADDISON SUMNER, A.B., M.D.

Born at New Haven, Conn.,	Sept. 15th, 1795
Graduated at Yale College,	1815
Received the degree of M.D. from Univ. Penn.,	1819
Practiced only in New Haven; retired many years before his death.	
Died at New Haven,	May 7th, 1851

Pallida pauperum
Mors aequo tabernas
pulsat regumque
pede turres.

MEDICAL COMMUNICATIONS.

ARTICLE XXVII.

THE EARLY PHYSICIANS OF TOLLAND COUNTY.

The Annual Address delivered before the Convention, May 28th, 1851.

By the President of the Society,

CHARLES E. SUMNER, M.D., OF BOLTON.

Mr. President and Gentlemen, Members of the Medical Society:

I trust every physician who has labored faithfully in the practice of our noble profession, whether located in city, village or country, is entitled to such appropriate notice as will preserve his name and memory from oblivion. The early physicians of Connecticut, and particularly members of the State Medical Society who have finished their labors and passed away, are worthy of our highest admiration. We owe them a debt of lasting gratitude for their successful labors through many difficulties and trials to advance the interests of our profession and the welfare of mankind. I have endeavored to collect such information as would enable me to present to you on this occasion a brief account of the early physicians of Tolland County, and regret that the task has been so imperfectly performed—for they were distinguished men, and will compare favorably with their professional brethren elsewhere. Some one having better qualifications and more time, will complete what I have commenced, so that justice may be done to the memory and fame of the early physicians of Tolland County.

It is almost impossible to ascertain when and where the early physicians obtained license to practice "Physic and Chirurgery."

Probably the greater number may have been licensed by the General Court, and some may have practiced without licence prior to 1791. It has been claimed that much of the practice of medicine in early times was empirical. Are we quite certain at what period that kind of practice wholly ceased?

At a meeting of the physicians and surgeons of the County of Tolland, convened at Tolland in said county, on the fourth Tuesday of September, 1792, agreeable to an act of the General Assembly of the State of Connecticut, incorporating a Medical Society in said State, the following gentlemen were present and considered as members, viz: Ichabod Warner, David Sutton, Miner Grant, Asa Hamilton, Jeremiah West, Joseph Parker, William Grosvenor, Joseph Kingsbury, Daniel Avery, Ebenezer Hunt, Samuel Willard, Elijah F. Reed, Reggles Carpenter, Caleb Merrick, Lewis Collins, Ichabod M. Warner, Dan Arnold, Simeon Field, Stephen Preston.

The meetings of the Tolland County Medical Society were held alternately at Tolland and Bolton until 1810. Since that time the meetings have sometimes been held in North Coventry, but for the most part in Tolland.

For want of time, but more particularly for want of the necessary information, I have left unnoticed the following physicians who were present at the organization of the Tolland County Medical Society, September, 1792, to wit: Drs. Miner Grant, Joseph Parker, Daniel Avery, Ebenezer Hunt, Elijah F. Reed, Caleb Merrick, Lewis Collins and Simeon Field. To these might be added others who were members of the society, who were received during the first twenty-five years after its organization.

Dr. James Stimpson was the first physician who settled in Tolland. He came from Lyme, Essex County, Mass., in 1710. He married Hannah Stearns, March 21, 1710. He had an allotment of lands made to him June 21, 1720. His attainments were fair, probably, for that period. Dr. James Stimpson died March 19, 1758.

Dr. Thomas Barnard came from Hadley, Hampshire County, Mass., in 1734. He had four sons, one of whom was in the ill-fated expedition that went to Cuba in 1762, and died there. Moses, another son, died in the Revolutionary Army in October, 1776, at New Rochelle. Dr. Barnard died in 1788, aged 78, bearing the reputation of a good physician, a very respectable gentleman and good citizen.

Dr. Samuel Cobb settled in Tolland in 1743. He was born in Wales, in Great Britain, in 1716. He married first, Mary Hinckley, of Tolland, by whom he had one son and one daughter. His wife died Dec. 9, 1746. He married second, Hannah Bicknell, of Ashford, April 11, 1749, and had twelve children—seven sons and five daughters. The descendants of Dr. Cobb are quite numerous. "It is not too much to say that Dr. Cobb was one of the most prominent citizens that ever resided in Tolland. He is reputed as having stood high in his profession, and as having possessed the entire confidence of the community. His practice was very general and extended into other towns. He was often consulted by neighboring physicians in cases of peculiar interest, and was considered the highest authority in all cases of difficulty and doubt. He was elected a Justice of the Peace for thirteen years, when there were but two magistrates in town; and most of the time he was the sole acting magistrate. In this sphere of duty he gave very general satisfaction. His moral influence in society was very effective in restraining vice and dishonesty, and in encouraging sobriety and virtue. While living he was greatly respected, and his memory will long be cherished as the conscientious upright citizen and honest man." The following epitaph is copied from the tablet placed over his grave: "In Memory of Samuel Cobb, Esq., a Gentleman of Public Education and distinguished abilities, who, having served his generation as a Physician and Minister of Justice to great acceptance, and in his life and death was an example of sobriety and virtue, and evidenced the influences and consolations of Religion, lived much esteemed and died universally lamented on the 6th day of April, 1781, anno aetatis 65."

Jeremiah West, M.D., son of Hon. Zebulon West, was born in Tolland, July 20, 1753, and was graduated at Yale College in 1774. It is not certain with whom he studied nor by whom he was licensed. He married Amelia Ely, of Bolton, daughter of Capt. Joel White's third wife, Feb. 8, 1781. He probably commenced business in Bolton, as his first child was born there. Mrs. Amelia West died April 28, 1786. Dr. West married second, Patty Williams, of Deerfield, Mass., Feb. 28, 1787, by whom he had five children—two sons and three daughters. Mrs. Patty West died Dec. 22, 1804. Dr. West married third, Mrs. Lucy Baker, of Brooklyn, Jan. 21, 1806, who survived him. Dr.

West was practicing in Tolland before May 18, 1784. He took an active part in the establishment of the State Medical Society, of which he was Treasurer in 1794, Vice President in 1803, and President from 1804 to 1807. He took a leading part in the organization of the Tolland County Medical Society, of which he was President six years, nine times one of its Fellows, and for many years Clerk. "He had a large practice, was skillful and successful, and was regarded as at the head of his profession in the county. Dr. West received the honorary degree of M.D. from Yale College in 1804.

He was much in public life. He was fourteen times elected a member of the General Assembly, and was a member of the State Convention in 1788 which ratified the Constitution of the United States. He was many years a Justice of the Peace, and fourteen years a Justice of the Quorum. "In stature, Dr. West was full six feet, with a large and well proportioned frame. He became exceedingly corpulent during the latter part of his life, and is represented as being unusually large and heavy. Tradition says that he weighed about three hundred and fifty pounds, and that his step as he walked seemed to shake the ground. In social life he was cheerful, humorous and pleasant. In his family he was peculiarly agreeable and companionable. He was an equal with the youngest member, and all were entirely free and easy in his presence. His death was sudden and singular. He had been from home during the day, and had returned just after the family had been to tea. He sat down to his supper and engaged in a conversation, unusually cheerful and gay. Suddenly he was seized with a fit of coughing, he moved his chair back from the table a short distance, and before any member of his family could get to him he had passed away. This event occurred Oct. 18, 1860. Aged 83 years and three months.

Dr. William Grosvenor practiced medicine in Tolland from 1787 to 1798. He married Mary, the eldest daughter of the Rev. Dr. Williams of Tolland, Oct. 4th, 1787. They had eight children, only three of whom survived their infancy. He was a member of the Tolland County Medical Society on its first organization in September, 1782, was Clerk of the society one year, and one of its Fellows in 1791 and in 1797. "He had a fair reputation as a physician, and was reputed to be a conscientious man and worthy citizen." He died Oct. 16, 1798, aged 34 years.

Dr. Gurdon Thompson, son of Samuel Thompson, of Mansfield, was born Feb. 22, 1767. "He studied medicine with Dr. Roger Wabbe, of Mansfield, Ct. He first located in Livingston Manor, N. Y., about 1790, and he resided in that place and in Brookfield, N. Y., until the death of Dr. Grosvenor, of Tolland, in the year 1798. Dr. Thompson then removed to and located in the town of Tolland, and was admitted a member of the Tolland County Medical Society, May 7, 1799. Dr. Thompson married Elizabeth Steele, of Egremont, Mass., Aug. 19, 1790. They had eight children—five sons and three daughters. One of his sons, Horatio, was educated as a physician, stopped a short time in Tolland, and finally located in Belchertown, Mass., where he died. One other son, Charles Steele, was educated as a physician, and located in Fair Haven, Ct. Dr. Thompson succeeded to a respectable practice, was rather popular with his patients, and regarded as very successful in treating insanity. He stood well with young men, and had a large number of students. He never took a very active part in public life outside of his profession; the only office he is known to have held was being Representative to the General Assembly one session. He died in Tolland May 28, 1829, aged 62 years and three months."

Asijah Ladd, M.D., son of Abijah and Huldah (Fuller) Ladd, was born in Tolland Aug. 15, 1788, and married Almy Cobb, daughter of William Cobb and grand-daughter of Dr. Samuel Cobb, Jan. 20, 1818. They had three sons, to wit: William Cobb, Charles Abijah and Theodore Stearns. Dr. Ladd studied medicine in the office of Dr. Josiah Bliss, of Tolland, and received a license to practice in 1813, and settled in Tolland. He received the honorary degree of M.D. from Yale College in 1834. He was a member of the Tolland County Medical Society; admitted in 1814; was Clerk six years, and was one of its Fellows six times. "Dr. Ladd always had a respectable practice; in one or two branches he was decidedly superior; was reasonable in his charges, and very indulgent to his customers. He maintained a respectable position in society, and was a very useful man." He died July 17, 1855, at the age of 67 years.

Dr. John Hutchins came from Plainfield, Windham County, Conn., to Bolton in 1747, and purchased a house and fifty acres of land there, of Dr. Samuel Shipman, of Hebron. Dr. John Hutchins was son of John Hutchins and grandson of Nicholas Hutch-

ins, who came from England in 1679 and settled in Groton, Mass. He practiced medicine in Bolton until the time of his death, which occurred Dec. 16, 1759, in the 65th year of his age. According to tradition he was a good doctor and a respectable citizen. He had quite a number of children, among whom were John, Jr., Joshua and Samuel Hutchins, of Bolton, and Joseph Hutchins, of Northampton, Mass.

Dr. Ichabod Warner was the successor of Dr. John Hutchins, at Bolton. He came from Windham in 1760 or 1761. He married Mary Lasell, of Windham, July 17, 1762, by whom he had six children—one son and five daughters. His descendants are numerous and highly respectable. He educated his son, Ichabod M. Warner, as a physician. He was a member of the Tolland County Medical Society, but was honorably dismissed from the society in 1797. Dr. Ichabod Warner stood high in his profession, and took an active part in the formation of the Tolland County Medical Society, of which he was President eight years, and one of its Fellows for the same period of time—from 1792 to 1800. The meetings of the society were held alternately at Tolland and Bolton up to 1801. At a meeting of the Tolland County Medical Society, held at the house of Dr. Ichabod Warner, in Bolton, in the year 1800, Dr. Warner applied for a dismission from the society, which was granted. "*Voted*, Thanks to Dr. Ichabod Warner for his long services as a worthy chairman of this society." This was the last meeting of the Tolland County Medical Society ever held in Bolton.

Dr. Warner was a man of ability, and held public office during most of his life. He was one of the selectmen often; was a justice of the peace more than thirty years, and was moderator of the public meetings generally. He was a member of the State Legislature twelve times, from 1779 to 1795. He was a member of the State Convention to ratify the Constitution of the United States in 1788, and voted in the affirmative. Tradition represents him as having been sometimes rather overbearing in his manner. It is related that in the trial of a suit before him, a man of questionable veracity was offered as a witness. The doctor refused to administer the oath to him, saying, "He will swear himself to the devil if I do."

Dr. Warner practiced medicine nearly fifty years, and much of the time his business was quite large in Bolton and the neighboring

towns. He acquired a handsome property, which he left to his heirs. He was a large man physically and mentally. He weighed from two hundred and fifty to two hundred and eighty pounds, and yet was in active business most of his life. He attended to his affairs up to the time of his death, as the entries in his book show. His death was very sudden and unexpected. He was found dead in his bed on the 15th day of Nov., 1815, aged 72.

Dr. Samuel Cooley, son of William and Elizabeth Cooley, was born in Bolton, Conn., Jan. 21, 1755. He married Amelia Abbot. Dr. Samuel Cooley was a student of Dr. Ichabod Warner. I have not learned where he obtained his license to practice medicine. He lived in Bolton some twenty years. He was surgeon in the United States Army in the second war with Great Britain, or during the early part of it. He subsequently practiced in Northampton, Portage County, Ohio, and died there Nov. 12, 1814, aged 59. He had five sons and one daughter. Dr. William Cooley studied medicine with his father in Bolton, and practiced in Manchester principally. Dr. A. A. Cooley, for a long time a druggist in Hartford, was another of the sons of Dr. Samuel Cooley. Dr. Cooley was considered a skillful physician and surgeon, and tradition says that the reason he gave why he did not have as much business as Dr. Warner had was that Dr. Warner had the best "How do you do?"

Dr. Ebenezer McCray settled in Bolton about 1791, as he was admitted a member of the Tolland County Medical Society in that year. He was delegate to the State Medical Convention in 1808 and in 1810. He was Chairman of the Examining Committee of Tolland County for granting medical licenses for some time. He read an interesting dissertation on Phthisis Pulmonalis before the Tolland County Medical Society in 1801, and received the thanks of the Convention. He remained in Bolton some twelve or fifteen years, and was in full business during that period. He was particularly noted in the treatment of chronic diseases. Dr. McCray was esteemed a good physician and a useful member of the church and society. He had one son and two daughters. He removed from Bolton to Wilbraham, Mass., about 1815, where he soon after died.

James L. White, Jr., M.D., son of Julez Loomis White, Esq., was born in Bolton, Conn., June 18, 1792. He was descended in the seventh generation from Elder John White, one of the first

settlers of Hartford, Ct., who came from England in 1632. He married Emily Hammond, daughter of Lemuel and Lora Kingsbury Hammond, of Bolton, Nov. 21, 1816, by whom he had four children. Jabez L. White, Esq., is the only one now living. He resides on the homestead formerly occupied by his father in Bolton. Dr. White attended school at Monson and Colchester, and studied medicine with Dr. Joseph Palmer of Ashford, Conn. The honorary degree of M.D. was conferred on him by Yale College in 1828. He first went to Tolland and commenced business, and remained there about one year, when he returned to Bolton, where he continued to reside during the remainder of his life. He met with strong opposition for some time, but gradually overcame it, and rose to high distinction in his profession. He was fortunate in having such men as John S. Peters, M.D., of Hebron, and Silas Fuller, M.D., of Columbia, as contemporaries and neighbors, with whom he was on terms of intimate friendship, and with whom he was frequently associated in medical consultations. Dr. White was a member of the Tolland County Medical Society and President of the same several years, and one of its Fellows in 1821, 1827, 1831, 1836 and 1841.

Dr. White seemed to possess all of the requisites for success in the practice of medicine. He was a large fine looking man, of commanding presence and agreeable manners—a capital story teller and joker. He was a man of the tenderest sympathies, and was always welcome in the house of sorrow or of pleasure. He had a vigorous and well balanced mind, well stored with medical knowledge. I think it is not too much to say that Dr. White was the most distinguished physician that ever lived in Bolton, and one of the first in Tolland County. No man ever took more satisfaction in obliging his friends, while he was kindest with his enemies. Dr. White was kind to the poor and unfortunate—furnishing them in many instances food as well as medicine and advice. He possessed the confidence of the people to a wonderful extent, and now, after more than a quarter of a century has elapsed since his decease, his memory is still fondly cherished by all who knew him in life. His practice was extensive and lucrative, and yet he found time to discharge the duties of the various public offices he was called to fill in an able and satisfactory manner. He was an acting justice of the peace many years, and his influence was always exerted in favor of peace and good order in

the community. He was several times a member of the General Assembly, and was four times a candidate for State Senator in the 21st district, and twice elected to that office. He was chosen State Treasurer in 1842 and again in 1843, and then declined a re-nomination. He failed by a few votes of receiving a nomination for Congress in the district composed of Tolland and Windham Counties. He would undoubtedly have received much higher political honors if he had lived. He left a handsome estate, for the most part accumulated by his own industry. He was an Episcopalian, but was liberal in his views, and contributed to the support of other denominations in a generous manner. He died in the midst of his usefulness, universally lamented, Aug. 4, 1844, aged 52 years.

Orrin Hunt, M.D., was born in Lebanon, in that part now the town of Columbia, in 1793, and studied medicine with Silas Fuller, M.D., of that town, and always enjoyed the full confidence of his distinguished teacher. He married Louisa, daughter of John Little, Esq., of Columbia, by whom he had two children—a son and daughter. He married second, Adeline Cone, daughter of Amos and Abigail (Hale) Cone, of Bolton, Sept. 11, 1826, by whom he had eleven children—five sons and six daughters. Dr. Hunt settled in Bolton before April 29, 1823, as he purchased land there at that time; he was successful in medical practice and esteemed as a citizen. He afterwards removed to Glastenbury, and remained there a few years and returned to Bolton, where he continued to reside and practice his profession the remainder of his life. Dr. Hunt was taught by affliction in his family and by protracted suffering in his own person to sympathise deeply with his patients, and his visits were thus rendered peculiarly welcome and soothing. His Christian influence was much valued, and his death was deplored as a great loss. Dr. Hunt was a member of the Tolland County Medical Society and twice one of its Fellows. He died of typhoid fever in August, 1850, aged 57.

Dr. Jonathan Fuller, son of Rev. David Fuller, of Willington, and fourth in line of descent from Thomas Fuller, one of the original proprietors of Dedham, Mass., was born at Willington May 24th, 1755. Destined for the profession of medicine, he was favored with more than an ordinary preliminary education under the instruction of his father. Having read medicine under the teaching of Dr. Lawrence, a practitioner of some eminence in the

neighborhood, he located in business in Mansfield in 1756. Here he remained actively devoted to his profession for more than half a century. He also served as deacon of the church in Mansfield, for a long period. He was ever regarded as a good physician and as an honest, exemplary man. He died in 1812. He was twice married,—first to a daughter of Dr. Cordial Storrs, of Mansfield, by whom he had one daughter. By a second marriage to a daughter of Rev. Joseph Meacham, of Coventry, he had two sons, Jonathan and David, and five daughters. His sons were both educated at Yale College.

Ezekiel Skinner, M.D., was born in Marlborough, Ct., in 1780. Having lost his parents early in life, he was apprenticed to a blacksmith, where he faithfully served the requisite term of time. Having a cast of mind which led him to have a great fondness for books, it was not long before he decided to qualify himself to assume the responsibilities of the physician. After remaining the requisite period of time in the office of Dr. John S. Peters, of Hebron, he took a course of lectures at the University of Pennsylvania, where the chairs of instruction were then occupied by Dr. Benjamin Rush and his compeers. He received the honorary degree of M.D. from Yale College in 1849. We believe that he at first located in Lebanon; but subsequently performed a large amount of medical business at Stafford and at Ashford, and finally at Greenport, L. I., where he died in 1858. He was an ardent admirer of Dr. Rush, and in practice he made a free use of the lancet and other depleting means. At one time, it is related of him, while a student, that for some supposed necessity he took blood from the jugular vein of a negro rather than from the usual place. The war of 1812 found in him a warm supporter, and although then in practice, he entered the service as a private. But it was not long before he was promoted to the rank of Assistant Surgeon, and served for a time in that capacity upon the southern frontier. He united to the calling of physician that of minister of the gospel, and was a warm advocate for immersion as the true and only mode of baptism. As a preacher he was impressive, and in argument was not easily vanquished.

Late in life Dr. Skinner entered the field as a missionary, and was sent to labor with the natives upon the western coast of Africa. While he was at Liberia a vacancy occurred in the chief office in the executive department of the government, and he served for a time as governor of that colony.

Dr. Jesse Williams, of Mansfield, was the successor of Dr. Jonathan Fuller, one of the earliest practising physicians of that town. Dr. Williams was born in Mansfield, Feb. 12, 1748, and was son of Capt. William Williams, of Watertown, Mass. Dr. Williams fitted for college in the school of Rev. Dr. Wheelock, of Lebanon, afterwards President of Dartmouth College. He received his classical education at Nassau Hall College, N. J. His diploma is dated Oct., 1768. I have not learned with whom he studied medicine or where he obtained his license to practice. Dr. Williams married Mary, eldest daughter of Major Joseph Storrs, of Mansfield, April 11, 1771, by whom he had eight children. In 1770 he was appointed one of his majesty's justices, and was continued in office until he became 70 years of age. He was several times a member of the State Legislature. About the year 1800 he exerted himself to overcome the prejudices of the community against vaccination. He vaccinated quite a number, and in 1804, when Judge Gurley's father died with the small pox, he obtained liberty to inoculate for that disease; and he offered to bear the expenses of all whom he had previously vaccinated, if they would come to his small pox hospital and have it tested. About thirty accepted the offer, were inoculated and exposed in various ways, but not one took the disease. This gave the community full confidence, and vaccination became general. Dr. Williams was considered a skillful physician and a most worthy citizen. He died Dec. 8, 1815, nearly 68 years of age.

Earl Swift, M.D., was born in Mansfield, Conn., April 5, 1784, son of Barzillai Swift, a wealthy and respectable farmer of that town. He graduated at Yale College in 1805, and studied medicine with Dr. Jabez Adams, his brother-in-law, and during the last year with Dr. Joseph Palmer of Ashford. He attended medical lectures at Cambridge, and was licensed to practice in 1808. He married Laura, daughter of Ralph Ripley, Esq., of Windham, Conn., where he practiced medicine about one year, and then removed to Wethersfield, Conn., where he practiced two years, and then he returned to Mansfield and continued there during the remainder of his life. "He continued in the active practice of medicine for nearly sixty years, and wholly relinquished practice, only about one year before his decease." He had a large practice, and was very skillful and successful as a physician; a man of sound and discriminating mind and good judgment, and

eminently a safe counselor. Dr. Swift was ardently devoted to his profession, and always cheerfully responded to his numerous calls, but was very inefficient in the collection of his bills, and only as necessity required presented them for payment. He died poor in this world's goods, yet he left the richest legacy which any man can leave to the world, a family of well trained, well educated and highly respectable children, and an example above reproach or suspicion. He had ten children, eight of whom survive him. Dr. Swift received the honorary degree of M.D. from Yale College in 1809. He was a member of the Tolland County Medical Society, and one of its Fellows six times. He was a member of the committee of examination from 1835 to 1843 and from 1847 to 1849. He died June 14, 1869, in the 86th year of his age.

Dr. Joseph Bush Wadsworth was born in Hartford, Conn., in 1747; was graduated at Yale College in 1765; he settled in Ellington, Conn., in 1775; was a surgeon in the Revolutionary Army.* "Old people invariably described him as the handsomest man and the most polished gentleman they ever knew." While in the army, Dr. Wadsworth kept a journal, which, together with many other historical papers, were after his death neglected and destroyed. "Besides his regular education, Dr. Wadsworth possessed many elegant accomplishments rare among his contemporaries. A peculiar neatness and elegance of taste and style were marked characteristics. Dr. W. wore a large three cornered hat, scarlet coat, white or yellow vest, and breeches and topped boots—a costume which it appears was rather common among those who occupied a high rank in society at that period. The following letter, written by him to his father-in-law, Mr. Allyn, of Windsor, may be of interest:

CAMP, WEST POINT, May 1, 1778.

Hon'd Father:—I return you my hearty thanks for the favor of your two letters. I can inform you that notwithstanding my taking a bad cold coming from home, whereby I have been incapable of joining my regiment until last Saturday, I am now through the goodness of God almost well. As to news here, we have none, except what you wrote. We have no enemies nigh that appear but snakes, and they have not yet forgot the severity of winter, and I desire the time may come when the Tories and

Ministerial tools may be as still as the snakes have been the winter past. Let me beg the favor of a line from you every opportunity, as it will revive the spirits of

Your obedient son,

JOSEPH B. WADSWORTH.

N. B.—I have now under my care twenty-one sick with measles, fevers, &c.

Dr. Wadsworth had the reputation of being an excellent physician and surgeon. He died in Ellington, March 12, 1784, aged 37 years.

Dr. JOSEPH KINGSBURY was born in Ellington, Conn., in 1756. At the age of twenty-one he enlisted into Washington's army for three years as a *fifer*. He was in the battles of Germantown and Monmouth and other engagements. He was also in the State troops for a time after his term of service had expired in the regular army. During the latter part of his service he was a sergeant. It was the settled purpose of Dr. Kingsbury, before he went into the army, to be a physician, and he improved every opportunity to gain information to that end in the hospitals, and the surgeons gave him what instruction they could; so that when he left the army he had made considerable progress, and had acquired much valuable practical knowledge, and after studying medicine with Dr. Wadsworth, of Ellington, for a time, he commenced practice there. About 1785 he married the widow of Dr. Wadsworth, who inherited a large fortune. His health failing, owing to the hardships he endured in his country's service, he gradually relinquished practice. Dr. Kingsbury was truly a self-made man—the son of a common farmer, who was destitute of the means to give his son an opportunity to acquire an education. He learned to write an elegant hand by practice on birch bark in place of paper, and obtained a good education by his own unaided exertions. He had the reputation of being a good physician. He was a member of the Tolland County Medical Society, being present at the organization of the same, September, 1792. He continued a member until 1798, when it was "*Voted*, That Dr. Joseph Kingsbury (on his application) be honorably dismissed from this society."

"For about twenty-five years before his death Dr. Kingsbury was a deacon in the church. He was a gentleman of the old

school, adhering to the costumes of the revolutionary age, which with his noble countenance and bearing, gave him the look of having stepped out of some splendid painting. Dr. K. was a rare instance of one who had the good fortune to ascend from humble life to the highest rank in his native town, and yet retain the warm friendship of the early companions whom he had so greatly distanced. He died at Ellington Aug. 20, 1822, aged 46.

Dr. Joel Carpenter, of Ellington, Conn., was born in 1720, lived many years in that town and died there Jan. 25, 1789. His wife was Mary Ruggles, of Massachusetts, of English descent. They had four children—Eli, Ruggles, Lucy and Mary, all born in Ellington. Eli and Ruggles were both educated as physicians.

Dr. Joel Carpenter served as surgeon in the Revolutionary Army, and was considered a man of ability in his profession.

Dr. Eli Carpenter settled in Grafton County, town of Oxford, New Hampshire. His wife was Abigail Baker, of Tolland, Conn. He was drowned in the Connecticut River in 1810 or 1811.

Dr. Ruggles Carpenter, son of Dr. Joel Carpenter, was born in Ellington, Conn. He practiced medicine some years there, and then removed to Tolland about 1813, where he remained a few years and returned to Ellington; from thence he soon went to some place in Massachusetts, and finally to DeRuyter, Madison County, N. Y., where he died about 1840. Dr. C. was a member of the Tolland County Medical Society from 1792 to 1811, when it was "*Voted*, To honorably dismiss Dr. Ruggles Carpenter from this society on his application this day made, Sept., 1811." Dr. Carpenter was Clerk of the society ten years or more, and was one of its Fellows or delegates to the State Medical Convention ten years. He is represented to have been a learned man and a skillful physician and surgeon. He was an agreeable acquaintance and a highly respected citizen.

Alles Hyde, M.D., of Ellington, was a member of the Tolland County Medical Society, having been admitted in 1796. He came from Hartford County to Ellington. The honorary degree of M.D. was conferred on him by Yale College in 1824, and he was one of the Fellows from Tolland County in 1825. He was esteemed a good physician and a worthy citizen.

Horatio Dow, M.D., was born in Ashford, Conn., Jan. 30, 1793, son of Thomas Dow, a highly esteemed citizen of that town. He was a student of Dr. Joseph Palmer, Jr., of Ashford, for a time,

and afterward was a student of Dr. Gilbert, of New Haven, where he attended medical lectures. He passed a satisfactory examination, and received a "License to Practice Medicine and Surgery" from the Connecticut Medical Society, dated March 28, 1818. He soon located in Vernon, Conn., succeeding Dr. Fuller, who died in the autumn of 1818. He married Miss Mary Skinner in the fall of 1821, and continued in Vernon fourteen years, when he sold his property and business to Dr. Alvan Talcott, and removed to Ellington, where he remained until 1846, when he removed to East New York, where he remained eighteen months. His next place of residence was New York City, where he remained one year, when he returned to his old home in Ellington, where he spent the remainder of his life. "In the practice of his profession, Dr. Dow was certainly successful, and always obtained the confidence of his patients." It was by his well-known frankness and severity that Dr. Dow won the confidence of his patients. If his patient was very sick he said so, and if not very sick he told him the truth, and probably offended many more by the latter than by the former course. He was fond of agriculture, and evinced his taste and skill in the cultivation of his farm. As a public man he was decided in his own views and in the expression of them on all matters of public interest.

Dr. Dow was a member of the Tolland County Medical Society, and one of the Fellows in 1823, 1828, 1834, 1836, 1840, 1842, 1844. He received the honorary degree of M.D. from Yale College in 1852. Dr. Dow died of apoplexy, Sept. 28, 1859.

Dr. Obadiah Hosford, of Hebron, petitioned the General Court to practice medicine in 1712. He had testimonials from Dr. Gershom Bulkley, dated May 7, 1712, and one from Dr. Samuel Mather, dated Windsor, May 11, 1712, who certified "that he had heard of his practice some years past, and by the good acceptance he hath had among his people, and by what he had gained by reading and experience in that science, Dr. Mather approved of his being an allowed physician." Dr. Hosford was a distinguished citizen of Hebron. He was a member of the General Court quite a number of years, and held other public offices. He was a large landholder and a man of wealth. He left one son, Talcott Hosford, Esq., a distinguished citizen of Hebron.

Dr. William Sumner, son of Clement and Margaret (Harris) Sumner, was born in Boston, Mass., March 18, 1690. He was

fifth in the line of descent from Roger Sumner, of Bicester, Oxford County, England. Dr. Sumner married Hannah, daughter of Thomas Hunt, Esq., of Lebanon, Conn., Oct. 11, 1721. He probably studied medicine in Boston. He settled in Hebron, Conn., in 1724, and continued to reside there until about 1768, when he removed to Claremont, New Hampshire, where he died, March 4, 1778, aged 78 years. He lived in the town of Hebron over forty years, and probably practiced medicine most of that time.

John R. Watrous, M.D., formerly of Colchester, and President of the Connecticut Medical Society, informed a sister of the writer that he remembered Dr. Sumner, and had visited at his house in Hebron before he left for Claremont, N. H., and spoke of him as being well educated, and a successful practitioner of medicine. Dr. Sumner had a large family—five sons and five daughters. His sons were William, Jr., Reuben, Clement, Thomas, Jonathan and Benjamin. William, Jr., and Clement were educated at Yale College. The former died during his last college term, and Clement graduated in 1758 and settled in Keene, N. H., as a Congregational clergyman. Dr. Sumner lived about one mile south-east of the "Gilead Meeting House," on the Hebron road. The house that he built more than one hundred and twenty-five years ago is now standing, and presents a very respectable appearance. He was quite a land-holder, and possessed a good estate for those times. He was tall and well proportioned, of light complexion and blue eyes, of quiet and unassuming manners, gentle and kind to all. He is represented as having been highly respectable and useful in the church and community. Quite a number of his descendants have followed the profession of medicine—some twenty in number, so far as known to the writer.

Dr. Dan Arnold and Dr. David Sutton, of Hebron, were members of the Tolland County Medical Society at its organization. Dr. Arnold was honorably dismissed from the society in 1789, and Dr. Sutton in 1801. I have not learned any important facts in relation to either. They were undoubtedly respectable practitioners of medicine, and Dr. Arnold was a distinguished citizen of Hebron.

John S. Peters, M.D., LL.D., of Hebron, was a distinguished man. He was son of Bezaleel and Annie (Shipman) Peters, of

Hebron, born Sept. 21, 1772. He was a self-made man. He commenced poor, and by his own exertions became highly noted in his profession and in public affairs. He was a member of the Tolland County Medical Society and one of its Fellows for eighteen years. He was Treasurer of the State Medical Society ten years, was Vice President two years, and President of the society from 1829 to 1832. He was fond of political preferment, and was always quite popular in Hebron and throughout the State. He was town clerk about twenty years and justice of the peace many years. He was judge of probate for the district of Hebron a long time, and frequently a member of the State Legislature. He was one of the assistants in 1817, 1818 and 1819. He was elected Lieut. Governor in 1827, which office he held until 1831. He was elected Governor in 1831, and re-elected in 1832. He was elected United States Senator by one branch of the Legislature in 1824. The House elected Hon. Calvin Willey, of Tolland. The next year Mr. Willey was elected.

Dr. Peters was an extensive land-hobbler, and took much pains to improve his farm and places. He used to ride on horseback, and thought that mode of traveling better for one's health, if less convenient and agreeable than riding in a carriage. His health was uniformly good until he was 84 years of age. About that time he made the following memorandum: "I am now in my 84th year. I enjoy good health, and have a competency of this world's goods, and am waiting patiently for that change which I know must soon come. I have had my full share of the labors of a country physician, and more of political offices and labors than ordinarily fall to the share of one citizen."

During the last two years of his life he suffered very much at times from disease of the urinary organs. He died March 30, 1837.

John S. Peters will long be remembered in the State of Connecticut as one of her most illustrious sons, and by the State Medical Society as one of its most distinguished and worthy members.

Orrin C. White, M.D., son of Asaph White, a respectable farmer of Hebron, was born April 28, 1803. He married Sarah Ann, daughter of Joel Post, Esq., of Hebron, Sept. 14, 1833, by whom he had four children, two of whom are now living, to wit: Daniel Wallace, born June 3, 1846, and John Henry, born Sept.

7, 1843. Dr. White studied his profession under the instruction of Jabez L. White, Jr., of Bolton, and John S. Peters, of Hebron, and retained the respect and confidence of his distinguished preceptors. He attended medical lectures at Yale Medical College, and received a license from the State Medical Society, dated March 2, 1820. He settled in Hebron, and remained there during his whole life. The honorary degree of M.D. was conferred on him by Yale College in 1847. He was a member of the Tolland County Medical Society, and several times one of its Fellows. Dr. White's health was delicate, yet he was most of the time actively engaged in practice until the last year of his life. He was a good physician and a highly respectable citizen. He held various offices in Hebron; was several times one of the selectmen, and held the office of town clerk quite a number of years, and was some time town treasurer, and was often a justice of the peace. Dr. White acquired a handsome estate, which he left to his family. He died Sept. 19, 1867, aged 64 years.

Dr. Davis McClure was one of the earliest physicians in Union, as he owned land there as early as 1756. In 1771 Dr. McClure lived in Stafford, and in 1774 he lived in Somers. He moved from Union to Stafford in 1797, but near the close of the century he returned to Union, and after some years he went to Stafford again, and remained there during the remainder of his life. During the intervals of Dr. McClure's residence in Union, his place was supplied by Dr. Stephen Preston and Dr. Rice, and one year by Dr. Moffatt.

Dr. Stephen Preston was the son of Medina Preston, of Ashford, Conn. He came from that town to Union, where he practiced medicine some time to the acceptance of the people. He was considered skillful in his profession. He moved from Union to Sangerfield, N. Y., where he had a lucrative practice. He died about 1840. He had a son named Medina Preston, born at Union, Sept. 23, 1792, who is now a physician at Sangerfield, succeeding his father.

Dr. Noah Rice succeeded Dr. Preston in Union, living in the same house where Dr. Preston had lived. He lived in town three or four years, and was succeeded by Dr. Hammond in 1800. I have never learned what became of Dr. Rice.

Dr. Joseph Moffatt came from Brimfield to Union in 1797, and in 1798 he sold his land, and went to Canowaa, N. Y. He

died at Brimfield. He had a son, Jesseph, who graduated at Dartmouth College in 1791. He was highly esteemed as a physician and citizen.

Dr. Solomon Hammond, of Union, Conn., was born at Sturbridge, Mass., Feb. 29, 1776, and died at Union July 25, 1857, aged 81. He married Polly Paul, daughter of Robert Paul, of Union, and had six children, all of whom are living. His eldest son, Rev. Charles Hammond, of Monson, Mass., graduated at Yale College in 1819. He was descended in the sixth generation from Francis Hammond, of Medfield, Mass., who came from England, and settled in that part of Dedham now Medfield prior to 1650. It was his father's intention to give him a liberal education, and with a view to that object he went to Leicester Academy. Disappointed in respect to a course at Harvard, he studied medicine with Dr. Eaton, of Dudley, Mass., and commenced practice at Union, Conn., in the year 1800, where he remained till his death. In early life he taught school, and retained his interest in education all his days. "He was very fond of flowers, and knew the names and medicinal virtues of every plant, shrub and tree." He loved music and poetry, and wrote respectable compositions in sacred music and in verse. He was a close observer of all natural phenomena, marking every unusual astronomical appearance. He studied the philosophy of his profession, and was familiar with the various medical theories of the ancient and modern practitioners. He lived in a small town, and had a practice limited by his circumstances; and with a delicate physical constitution, he shrank often from the toils and exposures of his calling, especially in his old age. He feared no mortal man, but had an instinctive dread of fierce winds and thunder-storms. He had a smile the most genuine ever seen on a mortal face, but never was known to shed a tear. His forte was fortitude. "He was scrupulously honest, honorable and conscientious, and yet was not connected with any church. He had an instinctive dread of vain, rapid talk on religious themes. They were too serious with him to be trifled with, as they really are in a great many so-called religious meetings. His views were those of the so-called orthodox denominations. He was a model farmer and horticulturist. He was a man of few words, especially in the rooms of the sick. His wit was apt and judicious, and he was a most agreeable companion. He was a distinguished physician and a highly respectable citizen.

Dr. Asa Hamilton, of Somers, Conn., father of Hon. E. E. Hamilton, M.D., of that place, was a member of the Tolland County Medical Society at its organization, September, 1792. He continued in practice until he was far advanced in life, as he visited a patient of the writer's as consulting physician in Coventry in 1846. He was then active and vigorous for a man of his years. He was a talented and successful physician and a worthy citizen.

Dr. Wood, of Somers, Conn., father of Hon. Orson Wood, M.D., of that town, was a distinguished man in his profession, but the dates and leading incidents of his life are wanting to make a proper notice of him. He was a highly respectable citizen.

Dr. Percival came to Somers after having served in the Revolutionary Army as surgeon, and continued to practice his profession there until the close of his life. He was highly esteemed as a physician and citizen.

Silas Fuller, M.D., was a native of Columbia, Ct., born in 1776. He practiced medicine there some years, was surgeon in the United States Army through the second war with Great Britain, and after its close continued to practice in Columbia until 1836, when he was appointed Superintendent of the Retreat at Hartford, where he remained until 1840. He continued to practice in Hartford until the time of his decease, which occurred Oct., 1847, aged 72. "His perceptive faculties were clear and accurate; his discrimination was excellent; his judgment sound. His sound common sense and good nature made him an acceptable visitor and pleasant companion. He was not unfeeling, and nature had made him to speak plainly and directly, instead of in a round-about manner."

Dr. Fuller received the honorary degree of M.D. from Yale College in 1823. He was a member of the Tolland County Medical Society, and several times one of its Fellows; was Vice President of the State Medical Society from 1834 to 1837; was President from 1837 to 1841. Dr. Fuller was a skillful surgeon, and highly distinguished in general practice. He held various offices in Columbia, and represented that town in the State Legislature in 1806 and 1807; and was a delegate to the State Convention in 1818, which formed the present Constitution of this State.

He educated two sons as physicians, to wit: Warren A. Fuller, M.D., who practiced in Columbia, and was a member of the

Tolland County Medical Society, and one of its Fellows in 1831 and 1834; and Samuel R. Fuller, M.D., who located in Hartford. They were promising physicians, but died young.

Alden Skinner, M.D., was born in Vernon, Conn., Sept. 27, 1789. He studied medicine with Horatio Dow, M.D., then of Vernon, and later with Dr. Gurdon Thompson, of Tolland, and attended medical lectures at New Haven in 1822, and received a license to practice. He immediately commenced business in Willington, Conn., where he remained seventeen years in full business. He married Dec. 9, 1824, Almira, daughter of Ebenezer Nash, Jr., of Ellington, a prominent and respectable citizen of that town. In September, 1839, he purchased the location of Dr. Alvan Talcott, of Vernon, where he remained twenty-two years, having an extensive business in Vernon and the surrounding towns. During the last few years of his life he lived in Rockville. Dr. Skinner always had enough to do. He was a heroic doctor, or was fond of heroic treatment. Blood-letting, cathartics, antimony, mercury, quinine, arsenic, &c., were his favorite remedies. He has the reputation of having been a skillful physician and surgeon. He received the honorary degree of M.D. from Pittsfield Medical College in 1854. Dr. Skinner was a member of the Tolland County Medical Society, and was often one of its Fellows and several times President of the society; he frequently represented the society in the American Medical Association. "Dr. Skinner was a man possessed of an uncommonly strong and vigorous intellect. His memory was large and tenacious. He was a well read man, perusing the best periodicals of the day." He was a most successful teacher of medicine, having instructed a large number of students. Dr. Skinner was not ambitious, and cared but little for political honors. He once represented Vernon in the General Assembly in 1850. He went to New Orleans in Nov., 1862, as Surgeon of the 25th Reg. C. V., where he died, March 30, 1863, of malarious typhoid, after a sickness of only a few days, aged 74 years.

Samuel Willard, M.D., son of Rev. John Willard, D.D., of Stafford, Conn. Graduated at Harvard in 1757 and Yale in 1816. He read an essay before the State Medical Society in 1804 on the Stafford mineral waters. In 1786 Dr. Joseph Warren, of Boston, carefully examined the Stafford mineral springs, and thought of purchasing them and establishing himself there, but was killed in

the battle of Bunker Hill, as is well known. Dr. Willard afterwards put Dr. Warren's plan in operation by building a large hotel for the reception of patients and others at that place. Dr. Willard was a noted man, highly distinguished in his profession, and deservedly popular as proprietor of the Stafford Springs House. He was a member of the Tolland County Medical Society, being present at its organization in 1792, and one of its Fellows frequently. Professor Dwight, in his "Travels," compliments the Stafford mineral springs under the care of Dr. Willard. He died at Cincinnati in 1821.

Nathan Howard, M.D., of Coventry, Conn., was a distinguished physician. He received the honorary degree of M.D. from Yale College in 1817. He was a member of the Tolland County Medical Society, and for several years its President, and was one of the Fellows from 1800 to 1823, twelve times. He was a representative from Coventry in the State Legislature in 1799 and in 1800, and perhaps at other times. He was a highly respected citizen of Coventry, and died in 1838.

Eleazar Hunt, M.D., was born in Coventry, Conn., Dec. 28, 1746, and spent his whole life in that town. He succeeded to the practice of his brother, Dr. Ebenezer Hunt, who died in the summer of 1810, and who had been some time in practice in Coventry. Dr. Eleazar Hunt married a sister of Eleazer Pomeroy, by whom he had two sons and two daughters. One of his sons was E. K. Hunt, M.D., of Hartford, a former President of the State Medical Society, the other, Pomeroy Hunt, Esq., a distinguished merchant in Texas. Dr. Hunt was a member of the Tolland County Medical Society, and was one of its Fellows several times, and was Clerk of the society four years. He received the honorary degree of M.D. from Yale College in 1826. As a physician, Dr. Hunt was discriminating, prudent and judicious. In the various departments of medicine he acquitted himself so successfully as early to secure the confidence of his townsmen, a position which he retained uninterruptedly and without a rival till age, with its infirmities, forbade further labor in his chosen pursuit. Dr. Hunt was a Justice of the Peace many years, and represented Coventry in the State Legislature. He was genial and sympathizing in his intercourse with the community, and gentlemanly and fair with his professional brethren. Dr. Hunt died March 14, 1807, of old age, aged 89 years.

John B. Porter, M.D., Surgeon U. S. A., son of William and Catharine (Root) Porter, of Coventry, Conn., was born July 3d, 1804, and sixth in line of descent from John Porter, one of the first settlers of Windsor, Conn., who died there in 1648. He married 1st, Anita Amelia Smith, of St. Augustine, Florida, May 23, 1842, by whom he had Francis Buckingham, born Feb. 16, 1844. He married 2d, Mary Smith Merriam Holden, of Chicago, Ill., Dec. 5, 1850, by whom he had John Bliss, Jr., born Sept. 27, 1857. He married 3d, Miss Mary M. Brewster, of Coventry, Conn., Aug. 18, 1864, by whom he had Arthur, now about 5 years of age. His sons Francis and John were born at St. Augustine, Fla. Dr. Porter received the degree of M.D. at Pittsfield, Mass. He practiced medicine for a time in Marlboro, Thompson and North Mansfield. He was appointed Assistant Surgeon in the U. S. A. Dec. 1, 1833, and was promoted to the rank of full Surgeon, Oct. 4, 1846, during the campaign in Mexico. Dr. Porter served through the Florida war, the Mexican war, a part of the civil war, and saw a large amount of service on the frontiers, and went to Utah in 1858, and returned in 1860. In 1858 he was on duty in New Orleans. The yellow fever began to show itself in the last of June, and did not cease until the last of November, and during this time there were over 5000 deaths from yellow fever alone. Every chief of staff was absent from New Orleans (two of them permanently) during the worst of the epidemic, and Dr. Porter was the only officer stationed in the city who remained at his post during the whole sickly season. He never left his post for yellow fever, cholera or any other disease, and during his long service of about thirty years in the army he was not absent from duty on leave but comparatively a short time. He was an accomplished surgeon and physician, one of the most able and distinguished of his compeers. He was held in high esteem by all who knew him. He was a member of the Tolland County Medical Society, after he retired from the United States service and returned to Coventry, and used to attend the meetings regularly, but never engaged in practice. Dr. Porter had spent much time and labor in collecting material for a history of his native town, and if his life had been spared a short time longer would have completed it. He died at Coventry, June 15, 1869, in the 65th year of his age.

ARTICLE XXVIII.

REPORT OF COMMITTEE ON MATTERS OF PROFESSIONAL INTEREST IN THE STATE.

BY H. A. CARRINGTON, M. D., OF NEW HAVEN.

Mr. President:—

Quite recently I was notified by the Chairman of the Committee on Matters of Professional Interest in the State, of the intended absence of both himself and Dr. Catlin from the State, and that, consequently, the duty of making the report of that Committee would rest upon me.*

I regret that one so competent as Dr. Hunt should not be here to discharge this duty; and all the more do I regret it, because, from the circumstances, the materials that *should* make up that report are not forthcoming, and because, therefore, the report if made at all, must take a different form and tone, from what I hope will be its character in the future. Though the Committee have little or nothing to report in relation to the subjects which were designed to form the basis of its report, ordinarily, it seems to me that we ought not to suffer this occasion, the very first of our meetings under the new rules and regulations, to go by default; and that the time calls for a statement of the relations of this Committee and its work to the profession, or, of the object or end sought to be attained by its creation, and to urge upon physicians the importance of co-operating with it, of giving aid and comfort to those who compose it, so that at our next annual meeting its chairman may be able to lay before us valuable results.

The By-Laws, Chap. 2, Sect. 6, state that it shall be the duty of the Chairman of this Committee "at every Annual Convention, to report the progress of our science, particularly in Connecticut—

* And consequently this paper is submitted without conference with the other members of the Committee; and to relieve them of responsibility, it is made in the first person.

remarkable and instructive cases of disease that have come to the knowledge of the Committee—interesting facts or discoveries relating to medicine—all circumstances connected with epidemics (if any have prevailed) and the treatment adopted, whether successful or otherwise,—in short whatever influences may concern the health of the citizens of Connecticut. And the more effectually to perfect this report, it shall be the duty of each County or other Association represented in this Society, annually to appoint one of its members as a Reporter, who shall furnish to this Committee on or before the first of May all the information he can get relative to these subjects, within the limits of the district within which the local association exists."

It will be seen from the statement of duties just read, that the design of this Committee, or the idea which led to its formation, is to furnish from year to year, through the publications of this Society, a complete Medical History of the State of Connecticut—an object which it seems to me cannot fail to commend itself to every intelligent and thoughtful physician. If it should be adequately executed, it would add very much to the interest of our transactions for every member of our own Society, and make them far more valuable to the profession at large; and the lapse of years would only add increasing value to them.

Very much might be said on this point, but it hardly seems necessary to say anything to prove a fact so very patent; the trouble I apprehend is, not that all cannot see it, or will not admit it, but that, though doing this, physicians will not feel the individual responsibility of giving the necessary aid to the Committee, so that its report may comprise the facts needed to give it real and permanent value, though the necessary tax on time and labor would not be appreciably felt by even the busiest practitioner.

The establishment of a new department in any purely voluntary society is an enterprise of some difficulty; and to get it in thorough working order will require much patience and no inconsiderable zeal; but if, as in the present case, the results promise to be so desirable, there surely ought to be enough of both in a society so large as this to accomplish the object.

How far the provisions of the by-laws in regard to the appointment of reporters by the various county associations have been observed, I am not able to say, though I fear not very extensively. Where this has been omitted or overlooked, I would suggest that

the President of the Association should, for the year ensuing, designate some one to serve in that capacity; being careful to call only upon *live* members, and such as would be willing to do themselves and the Society a good service by giving the little time and trouble demanded by the performance of such duty.

But even if a reporter is appointed, and is zealously affected toward the work, he cannot do all that is required unless physicians are willing to assist him. To him should be sent all cases deemed worthy of publication, notes of any epidemics, their rise, progress and decline,—any changes in the type of prevailing diseases which may be observed,—new and successful applications of old remedies, and the results of the use of any new remedies which may have been brought before the profession. In this manner, through the agency of this Committee, the profession might and should be resolved into a committee of the whole to investigate and report upon the more prominent features of our current medical history. In regard to medicines, by this extensive comparison of results, we should be assisted to arrive at correct conclusions much sooner, and with a feeling of greater security, than is possible in a small field, in which the conditions cannot be so varied as in the larger one.* As to the history of disease, their varying forms—their epidemic or endemic character—of the recurrence of diseases supposed to be incident to form or condition of the country (as intermittent fever,) of their natural history so far as can be ascertained—how much of value might be accumulated from year to year in the pages of our Transactions, if physicians would engage in the work with the earnestness it deserves. At present, these facts, when published at all, are given out through some Medical Journal, which may not be seen by the great majority of our members, and so lost to them. But if they were reported to your Committee, and published in your Annual Volume, they would certainly be in the right place, and should thus come to the knowledge of all our members; for I should hope that in this way

* We might also extend the usefulness of the Society in this direction by assigning to various members certain articles of our indigenous medical flora, in regard to which we have not as extensive or as definite knowledge as we desire, with the request to use them in their practice, noting carefully the results obtained therefrom in the largest number of cases possible, and to report what they have observed. By thus comparing the recorded results of the experience of different observers we should be able to correct the one by the other, and obtain a residuum on which we might rest.

we should be able to give a volume of sufficient interest to be read by every one who knows enough to read, and not, as is the case now with some at least, to lie upon their tables unread. As men raise what they work for, and in proportion to their labor, the more extensively physicians contribute materials for the report of this Committee, the more general will be their interest in it, and in the Proceedings of this Society. It is unfortunately true that physicians take but little interest in what tends to the general good, forgetting how very intimately the general and the individual well-being are bound together. Those who labor to improve the character, or increase the value of our Transactions, are laboring for themselves even more than they are for others. However respectable our Transactions may appear in the comparison with similar volumes of other societies, it will not be questioned probably that much may be done to improve upon the past; it certainly cannot be for want of *ability* among us if we do not so improve; our fault will be due to lack of proper effort. Committees may be appointed *ad infinitum*, but unless the general sentiment of the profession does sustain and aid them in the discharge of work laid upon them, it will be only a vain business, a mere waste of time. It is in the hope and with the expectation that the physicians of our State are ready to some extent at least to give the necessary aid to the Committee on Matters of Professional Interest, when they really understand what is expected of them, that this tentative report has been written.

If more of the members of the State Society were in the habit of attending its meetings, we should expect to see them more willing to work for it, and more desirous of doing something to increase its usefulness, and contribute to make its meetings more interesting. Physicians, it seems to me, make a great mistake, and do themselves harm by neglecting or refusing to meet with each other in the various associations which are intended to bind them together, and create or increase a proper *esprit de corps*. The natural tendency of our profession is rather to isolation, to individuality: consequently there is need of these associations for the purpose of unifying and fusing it; and a genuine interest in the profession as a science would lead men to these meetings even at some expense of time and money. But if we look at our county meetings, what is the fact? oftentimes hardly enough come to them to appoint officers; and our Annual Meeting has been attended by

very few besides the delegates, and by only a part, often a small part, of them. The spirit which we ought to cultivate is that of zeal for the science itself, and not simply as means of earning daily bread, or of making a fortune. We call medicine one of the liberal professions, but if its members shut themselves up in their own narrow spheres like an oyster in his shell, we shall hardly make good the assertion. It is to be hoped that the new rules of our Society will help to bring out a full representation of our members, and that thus our annual meetings may grow in interest and value; it is to be hoped that even those members who have never taken any interest in these meetings will gradually come to understand that this is *their* meeting, that it does not belong to a few, but is for all. But while we hope to find this class beginning to be interested in this society, it is to the younger members that we turn with more of expectation for aid and assistance in building up the reputation of this as a working society.

In relation to the degree of sickness in our State during the year past, so far as your Committee are aware, there has been nothing unusual or specially remarkable. In one respect, however, there is matter for inquiry; I refer to the prevalence of intermittent fever,—a disease which had been supposed due to conditions that have passed away with the settlement of the country. But within a few years it has invaded very considerable portions of our territory, and in some localities has taken on a form of great severity and persistency. In some districts every family and every member of each family has been subject to its attacks. The history of its course since its first appearance among us is very desirable, in order that we may make new investigation of its causes.

There is another subject which may well be termed a matter of professional interest in the State, and that is the Medical School in connection with Yale College. I am happy to say that the number of students attending the current Summer session is considerably larger than it has ever been; and I can but believe that if physicians and medical students throughout the State understood their true interests, that more yet would be found attending its courses, both Summer and Winter. I believe it to be a fact which cannot be successfully disputed, that for at least the two first years of his course, the student can pursue his studies in this school more advantageously for himself than in our large cities, and in connection with the great hospitals. I am well aware of

the fascination of the former for the young, and of the prominence assigned to the latter in annual circulars, but I am sure that the advantages of the last to the younger classes of students are very much overrated both by circulars and students, and that the temptations of the first are quite injurious to habits of study. The first two years of a medical student's life should be devoted to the study of anatomy, of physiology and chemistry, of materia medica and pathology; then having laid broad and solid these foundations of his profession, assisted in their acquisition by a small number of cases which shall serve to illustrate but not to confuse his studies, as will be the result where large numbers of patients are crowded before him, then he may and ought to be in condition to profit by a broader field and larger experience.

The condition of our county associations is, so far as I can learn, for the most part one of chronic debility. Meetings are usually held but once a year, and the attendance is very limited. Of course there are good excuses for physicians many times for not attending these meetings; but these excuses are always forthcoming if there is little or no interest in the society. Distances required to be traversed are sometimes so great, the traveling so bad, and so little said or done worth the trouble required, that many become permanently discouraged, and make no effort to attend the meetings. Growing out of this condition of affairs are two suggestions which I offer as possibly worthy of consideration. The first is to reduce the territory of the local associations, by dividing the counties into two or more districts, so that members may reach their respective places of meeting with less expenditure of time than is now demanded of most of them; I do not know how far this would be considered an advantage, but I should suppose, judging from my own experience, that it would aid some to attend who now are precluded from doing so.

The second point is the propriety of changing the annual meeting to the Fall, instead of holding it as now in the Spring. The weather is usually, and the roads certainly are better in the Fall than in Spring. Of course, where communication is by Railroads this would be no argument; but many of the country towns as yet have not communication by rail, and physicians must rely upon horse-power. But whether these suggestions, if reduced to practice would do anything to increase the *disposition* on the part of the members to attend the meetings, I am not prepared to say;

for I do not lose sight of the fact that one of the greatest obstacles to such attendance is the uninteresting character of the meetings themselves, and that is a trouble which will not be cured by any topical prescription I can offer; it can only be remedied by each person taking hold with the earnest determination to do his part to make them better.

ARTICLE XXIX.

CELLULAR PHYSIOLOGY AND PATHOLOGY.

Read before the New London County Association.

BY ASHBEL WOODWARD, M. D., OF FRANKLIN, CONN.

Within barely more than a quarter of a century, Cellular Physiology and Cellular Pathology have had their birth, and advanced to the dignity of an elaborate science. In 1838 Schleiden demonstrated the method of the formation of the cell in vegetable structures, and that the cell is the ultimate element of which the vegetable is built up. This view Schwann at once applied to animal structures, and the investigations of these co-laborers, conducted as they were with wonderful clearness and precision, laid broad and deep the foundations of the science. Their success attracted other minds, and some of the keenest intellects of the present generation have since pursued the same inquiries. Thanks to their labors, the mysteries of life and disease have been largely unveiled, and we have every hope that our rapidly augmenting knowledge of the nature of disease will disclose still surer methods for combatting it. It is proposed in this paper to take a brief survey of the results thus far achieved in this department of medical and scientific research.

In the vegetable kingdom the cellular system is unfolded with most simplicity, and it may assist us to clearer views upon our subject if we first briefly consider the nature of the vegetable cell. Let us take for instance one of the minute stinging hairs that project from the surface of the common nettle. In the field of a sufficiently powerful microscope this little hair is seen to be, not an inert fibre, but an organization instinct with life. We behold a thin wooden bag or envelope, inclosing a translucent fluid, which moves round in slow but ceaseless currents within its narrow confines. This nettle hair may serve as a type of the vegetable cell.

It consists of a clear, active, germinal fluid, enclosed in an inert cell wall or wooden case, the whole of microscopic minuteness. Of millions of such cells, variously intertwined and bound together, the structure of the nettle is built up, and as in each individual cell life inheres in the germinal fluid alone, so in their aggregation into the plant the life of the plant is lodged in the germinal fluid of the separate cells of which the plant is constituted. The harder material of the cell wall is as it were dead, but the germinal fluid is endowed with all the attributes of life. It absorbs food through the cell wall, assimilates this food for its own growth, converts it into the fabric of the cell wall, and also gives birth to new cells. It is convenient to have a single term by which to designate this living fluid, and for this purpose the word bioplasm, compounded of βιος 'life' and πλασσω 'plasm' has been suggested by Dr. Lionel S. Beale.*

Not uncommon are plants consisting of but a single cell; such are the Red Snow Plant, which under favorable conditions multiplied in such inconceivable numbers as to suddenly redden broad tracts of artic or alpine snow; or the different species of Oscillaria, which, though of microscopic minuteness, may tinge the surface of whole lakes with a green hue at certain seasons of the year. Similar plants abound everywhere in nature, and perhaps present as great diversity of form and size as the kinds of ordinary vegetation, though they are generally so minute as to be individually invisible to the naked eye. These unicellular plants offer us the simplest forms of vegetable life and growth, and in not a few of them the actual growth may be observed. The yeast plant is an instructive example. If a portion of yeast not larger than a pin's head be brought into the field of the microscope, it will be seen to consist of numerous little oval cells, very minute, and yet each an independent plant or individual, and consisting, like the cell of the nettle plant, of an hardened exterior surface enclosing a limpid germinal fluid. Now under a higher magnifying power these oval yeast cells appear studded with little eminences, from one to a dozen projecting from the surface of each plant. Under a still higher power these eminences prove to be protrusions of the germinal matter, with a thin layer of cell wall

*The word protoplasm has been much used in this significance, but as Dr. Beale has remarked, the term bioplasm gives us by analogy a more distinctive word, and one which readers fond of employing as a term of scientific accuracy.

forming round them, and still connected by a narrow channel with the germinal matter of the main body. Soon these little 'buds' detach themselves, and new plants are born, destined to grow and multiply like the plants from which they sprang. When first detached, many measure less than the $_{10000}$ of an inch in diameter. Reproduction is in this case a very simple affair. Portions of the germinal matter merely separate and begin an independent existence. Here, as everywhere, the germinal matter or bioplasm is the vital part. It converts lifeless, inorganic matter, into active, living, growing matter like itself, which in its turn assimilates and vivifies other matter. The cell wall is an inert substance elaborated by the germinal matter and built up about itself.* The cell wall, however, is of the utmost importance. It constitutes the frame work of vegetable structures, imparting to them firmness and strength. Ordinary wood consists almost wholly of cell wall, that is, of an aggregation of very thick walled cells. But we must not forget that cell wall is functionless, and owes its very existence to the vital powers of bioplasm. In this bioplasm, then, we are brought face to face with the great mystery of life. But here we stop. Science cannot fathom it. She cannot say in what manner vital force is evolved from the chemical combination which she finds, nor can she account for inherent differences of power. For the best microscopes disclose no difference between the bioplasm of the oak and that of the yeast plant, and chemistry with all her skill finds none. Yet one developes into a lowly fungus, while the other, multiplying many million fold, but ever true to itself, slowly builds up the towering oak. The bioplasm of the oak will never produce a yeast plant, neither will the yeast plant ever grow into an oak.

In all situations the vegetable cell is essentially the same. But the proportion between the bioplasm, or central germinal fluid, and the cell wall may vary greatly. In the tree the cell wall becomes very thick, and the bioplasm consequently diminishes, or even altogether disappears in the center of the tree and some other situations where the cell is practically dead, and no longer a living, typical cell. The dimensions of vegetable cells are very

* Bioplasm, in its conversion into cell wall, undergoes a marked chemical change, losing its nitrogen. Bioplasm consists of *four* elements, Carbon, Nitrogen, Oxygen and Hydrogen, while cell wall consists of *only three*, Carbon, Oxygen and Hydrogen.

various, but most of them can only be distinguished by a powerful microscope. They generally vary from $\frac{1}{250}$ to $\frac{1}{2500}$ of an inch in diameter. Many are vastly smaller.

From the vegetable kingdom to the lowest forms of animal life is but a step. The amœba is one of the simplest forms. These little creatures, seldom reaching $\frac{1}{250}$ of an inch in diameter, can easily be found in water that has been kept moderately warm for a few days, and consist of pure germinal matter enveloped in an exceedingly thin membrane of firmer texture. This germinal matter or bioplasm resembles that of the plant cell, and is endowed with similar vital powers. It assimilates dead matter, and converts it into its own living substance, and from time to time little portions detach themselves, as with the yeast cells, and become separate, independent organisms. It is also in constant motion, expanding and contracting, and moving from point to point, in the fluid in which it is suspended. In this power of locomotion we notice a general, though not universal, distinction between the lowest animal and vegetable organisms.

Now the bioplasm of the little embryo from which is evolved the human organism, with all its complexity of structure, cannot be distinguished from the bioplasm of which the highest development is the simple amœba. The most skillful observer would detect nothing peculiar to the bioplasm of either of the two, by which he could decide which would produce only the amœba and which a human being. It is simply a minute mass of perfectly colorless, living matter, in which no indications of form or structure can be discovered. This embryonic bioplasm grows by the conversion of nutritious matter into its own substance, and from it, as in the amœba, from time to time, little portions detach themselves and grow to the size of the parent mass. From these in the same way spring other bioplasts, so that in a short time one particle of bioplasm gives rise to countless numbers of descendants. In accordance with some law of evolution, the bioplasts thus produced arrange themselves in the outlines of the future limbs, organs and tissues. After a time the vital activity is not confined merely to evolution of other bioplasm from the existing bioplasm, but the germinal masses begin to form an exterior deposit of a harder texture evolved from their own substance, and which we may call 'formed material.' Just as the bioplasm of the plant deposits around itself layer upon layer of cell wall till the thick woody growth of the tree results, so the bioplasmic

masses of the fœtus deposit around themselves ever thickening layers of 'formed material,' and the firm texture of muscles, tissues, nerves and bones is formed.* Young tissue consists of masses of germinal matter enveloped in extremely thin layers of formed material, that is, of a nearly continuous body of bioplasm. But as the growth proceeds, the formed material thickens, and in the fully grown tissue we have an extent of formed material dotted with little patches of bioplasm. The same may be said of muscles, nerves, &c.

Some masses of bioplasm, however, do not deposit 'formed material' to any extent, but continue to divide and subdivide as did the bioplasm of the embryo. Among these are the white corpuscles of the blood, which can readily be examined if a drop of blood be pricked from the finger and placed under a sufficient power. They are colorless, spherical bodies, exhibiting movements like those of the amœba, and multiplying by projecting small portions of their substance, which become detached and grow into complete corpuscles.

The cell or ultimate element of animal structures consists, then, of matter in two conditions, of an interior active, living, growing, germinal matter or bioplasm, and of an external passive matter of firmer substance enveloping the bioplasm, and which we may call 'non-germinal matter' or 'formed material.' The proportion between the two varies greatly. "In the amœba, in the white blood corpuscle, in the pus and mucous corpuscle, we have almost pure germinal matter, with a scarcely appreciable ring of formed material on its periphery; while in the old epithelial cell we have almost pure formed material with a mere point of germinal matter, constituting the nucleus near its center; and in the red blood disc we have pure, structureless formed material. In old tendon, again, the proportion of formed material is large and germinal matter small, while in young tendon the reverse proportion exists."† The size of this elementary part is also very various. The human ovum, a typical cell, varies from $\frac{1}{175}$ to $\frac{1}{120}$ of an inch in diameter, while epithelial cells sometimes grow as large as $\frac{1}{70}$, and cells of morbid growth $\frac{1}{250}$ of an inch in diameter.

Dr. Beale has measured particles of germinal matter less than

* The analogy, however, is not complete. In vegetable cells, as we have seen, the bioplasm loses nitrogen during its conversion into cell wall, but in animal cells both bioplasm and formed material contain nitrogen.

† Dr. Tyson. The Cell Doctrine, p. 112.

$\frac{1}{1000}$ of an inch in diameter, "which would not be called cells in the ordinary sense of the word, yet they are functionally such; that is, they grow, multiply by division, and under appropriate circumstances assume the characters of fully formed cells." The germinal matter or bioplasm constituting the nucleus of fully formed cells varies from $\frac{1}{2000}$ to $\frac{1}{4000}$ of an inch in diameter. Of course, in these fully formed cells the formed material is proportionally very large.

The life of the body evidently ultimately resides in the bioplasm of the cells. As we have seen, the embryonic nucleus is a minute mass of bioplasm, and from this embryo, growing, dividing and subdividing, spring countless multitudes of descendants, which build up the tissues of the body. The formed material deposited by the bioplasm masses about themselves, and constituting by far the greater part of fully grown tissues, muscles, &c., giving them firmness and solidity, is comparatively dead. It can neither assimilate food, nor can it of itself grow.* While it has important functions, it is dependent for its maintenance, and the growth necessary to repair its constant wasting, upon the germinal matter. In short, the bioplasm alone has the power of life and growth. "All active change which takes place in the tissue depends upon this bioplasm, however little there may be. If there be none, the tissue is as incapable of undergoing active changes as if it did not form a part of the body."†

Bioplasm, then, is the seat of vital change, and if we would fathom the mysteries of life and disease, we must study them in their intimate manifestations in bioplasm not less than in their outward effects. We propose to glance at some of the changes occurring in bioplasm in disease.

If a section be made through the epithelial cells of certain mucous membranes, for instance, of the fauces, the deeper layers will

* "Formed material is without the property of germinating, or multiplying itself or even maintaining itself. Yet it is exceedingly important, and as essential, indeed, to the functions of the economy, as the germinal matter. It is in fact the portion of the cell in which alone function resides, since it is to the formed material of the muscle-cell that we owe the property of contractility, to the formed material of the nervous element that we are indebted for sensibility, and to the formed matter of the epithelial cell that we owe its protective qualities; while the secretion of all glands is the formed material of the gland-cells." Dr. Tyson. The Cell Doctrine, p. 110.

† Dr. Beale. Disease, Germs: their Real Nature, p. 27.

consist of nearly pure germinal matter, or bioplasm divided into cells by extremely thin partitions of formed material. In the successive layers outward the formed material increases in thickness, till in the fully grown cells of the surface it largely exceeds the bioplasm, a surface cell consisting of a body of formed material with a little nucleus of bioplasm in its center. The growth of mucous membrane, then, is very simple. In the deeper portions we have germinal matter dividing and subdividing. The resulting cells of nearly pure bioplasm are slowly brought toward the surface by the exfoliation of the outer cells, and as they move outward the bioplasm of the cell gradually deposits more and more formed material about itself, till at the surface the normal epithelial cell results. In inflammation this regular growth is interrupted. In consequence of increased nutrition, the deeper bioplasm masses divide and subdivide with great rapidity. So rapid is their growth, that time is wanting for the regular deposition of formed material, and soft, spongy cells reach the surface in which formed material is nearly wanting. These are precisely the characters of mucus given off in slight inflammation of the throat. Under the microscope, mucus is resolved into cells of bioplasm with an exceedingly thin soft coating of formed material. If the inflammation be more severe, that is, if nutrient material be more abundantly supplied, the growth is so rapid that no formed material is deposited, and the pathological matter known as *pus* results. We thus see that pus is due to the too rapid growth, in consequence of increased nutrition, of normal bioplasm. It is pure but degraded bioplasm. To the eye it resembles ordinary bioplasm; but it can never build up tissue, and in its growth it divides and subdivides into masses of degraded bioplasm like itself.

Some observers have evidently examined dead instead of living pus corpuscles. The dead pus corpuscle coagulates, and presents an appearance which might easily mislead. But the appearance of the living pus corpuscle admits of no mistake as regards its nature. It is not an aggregation of the dead particles of disintegrating tissue, as some have concluded. Neither is it an exudation poured out by the overburdened cells. Mucus and pus are simply the result of the rapid, morbid growth and multiplication of the normal bioplasm of the tissues.

The process here traced in the epithelium of the mucous membrane of the fauces may be demonstrated of the other mucous

membranes. For instance, in inflammation of the bladder, the results of a similar growth are seen in numerous pus corpuscles floating in the urine, and exactly similar to pus corpuscles from other localities. Inflammation is invariably attended with increase of the germinal matter of the affected region, as Dr. Beale has so clearly demonstrated in his recent works. In fevers, the changes of the germinal matter occurring generally precisely resemble those observed locally in inflammation. As Dr. Beale remarks, "the local phenomena of inflammation precisely correspond up to a certain stage with the general phenomena of fever."

The rapid growth of bioplasm in all these cases appears to result from increased nourishment beyond the amount necessary to maintain the normal growth. By the harmonious working of the different organs during health, pabulum is distributed to every portion of the system in quantity just sufficient to provide for growth in compensation for the incessant wasting consequent upon vital action. But the moment any organ fails of its full activity, the balance is disturbed, and disease may follow. Do the glands fail to eliminate from the system the products which it is their function to remove, or, if in consequence of imperfect oxydation, compounds are formed less highly oxydized than urea, uric acid, carbonic acid and other normal compounds, and hence less easily excreted, the blood becomes laden with improper pabulum, which nourishes the germinal matter, and favors its abnormal growth. If now free action of the skin, kidneys and bowels can be induced, these compounds are removed, and a return to a healthy state ensues. But if these organs fail to act, the bioplasm continues to increase enormously. This increase is primarily chiefly in the capillaries, for what reason it is difficult to state. Here the germinal matter multiplies to such an extent that the vessels become distended and obstructed, and the circulation of the blood is partially or wholly impeded. In inflammation these changes are restricted to a part of the body, while in fever they may occur throughout the entire organism, and in severe cases they do occur in every part of the body. The bioplasts of the tissues, fed from the same source as the bioplasts of the capillaries, increase rapidly. We have already traced this process in inflammation of the mucous membranes. If the diseased action be general, and the bioplasm continues to grow till the capillaries of the whole body become obstructed, death is inevitable, and the permanent obstruction of

the vessels of any part of the body is sure to be followed by the death of that part. In this way boils and sloughs are produced, and if an extended area be affected, mortification may ensue.

We turn now to the changes induced by the introduction into the system of infectious or contagious matter. Contagious germs have been, and are still, the subject of earnest discussion, and opinions differ widely. Certain cases, however, do not seem to admit of doubt. In gonorrhœal inflammation there is a growth resembling ordinary pus, and not to be distinguished from it, though possessing specific contagious properties, and particles of this transferred to certain mucous surfaces absorb nourishment and multiply there. "These particles will retain their vitality for some time after their removal from the surface upon which they grew. They may even be transported long distances by the air, or they may remain for some time in moist clothes without being destroyed."* Of a similar nature are the germs of purulent opthalmia. It is an interesting fact that the pus of gonorrhœa will occasionally produce severe opthalmia. In post mortem dissections the operator sometimes unfortunately becomes inoculated with the pus of inflamed tissue, the minutest portion of which is sufficient to poison the whole system in a short time. The above are cases of contagion resulting from the growth of vitiated pus or germinal matter, which, once introduced into the system, grows and multiplies like ordinary pus, from which indeed it cannot be distinguished. But there exists an inherent difference in vital power, under control of which the specific poisons of each are manifested. If we bear in mind that our highest powers cannot distinguish a particle of the bioplasm of the amœba from that destined to develope into a human being, we should not be surprised at our inability to distinguish between the different kinds of pus, whatever may be their differences in vital power.

Diseased bioplasm may also transfer morbid action from point to point of the same system. "In bed-ridden patients the expectoration of phthisis often marks its passage along the back of the wind pipe by rows of ulcers, ceasing at the glottis; the same secretion would appear sometimes to cause intercular ulcers of the intestines. An unhealthy wound—any kind of sore—will set up an irritation or suppuration through the lymphatic vessels to the glands to which they run—that is germinal matter from the

* Dr. Beale. Disease Germs: their Real Nature, p. 55.

wound gives rise to the formation of similar germinal matter in the gland. The explanation of the so-called sympathetic bubo of gonorrhœa is similar. In the same manner tubercle or tuberculoid matter may pass from the intestine to the mesenteric, and from the lungs to the bronchial glands. Cancerous matters also seem to prefer these channels to those of the general circulation. Pus passing into the systemic veins gives rise to purulent deposits; and in dysenteric and other intestinal ulcers, through the portal vein, it causes abscess of the liver."*

To get at the nature of the germs of the various fevers is not so easy. All admit that living germs of some kind make their way into the system. These germs many believe to be vegetable fungi, and indeed it seems reasonable to attribute such an origin to ague and the other malarious fevers, which are not properly contagious diseases. But with regard to the real contagious fevers, we incline rather to accept the views of Dr. Beale, so ably put forth in his recent works. If vaccine lymph fresh from the growing vesicle be examined under high powers, it will be found to contain a great number of extremely minute particles of bioplasm or germinal matter, and in these particles of bioplasm resides the active power of the lymph. For if they be allowed to subside, no effects are produced by inoculating with the supernatant fluid, while the full effects are produced by inoculating with the deposit. "† These little particles cannot be distinguished from the minute particles of pus or other germs of living germinal matter, the smallest particle of which, when supplied with its proper pabulum, will grow and multiply, giving rise to millions of little particles like itself, each having similar properties and powers." The small pox vesicle contains multitudes of minute particles of bioplasm, which as we might expect, present nothing characteristic. In the cattle plague, the blood from the smaller vessels, the mucous secretions, and the milk of infected animals are found swarming with these same minute living particles, and, as is well known, a small portion of the blood or secretions will transmit this terrible disease. If, then, in these and other contagious diseases we find the poisonous exudations abounding in minute and similar particles of living matter, and can prove that in vaccine lymph the active power resides in these particles of bioplasm, and not in the exuda-

* Dr. Roberts. Germinal Matter and the Contact Theory, p. 58.
† Dr. Beale.

tions in which they are suspended, it is reasonable to infer that in all these exudations the minute living particles are the active poisonous agents. From what we have already seen of bioplasm, we can readily believe that these little particles, though to all appearance exactly similar, may yet differ vastly in inherent vital powers, and be the potent causes of very distinct contagious fevers.

When these contagious particles reach the blood, changes are produced resembling those occurring in ordinary fever and inflammation. Those diseases are attended by increased growth of the bioplasm of the system, while in contagious we find a similar growth of foreign particles of bioplasm. These, penetrating the system, appropriate the pabulum of the blood, and increase enormously. Soon the capillaries become distended with them, as already shown in fever, and the capillary circulation is impeded. If the obstruction continues, serious alterations follow without the vessels. Minute particles of bioplasm make their way through the distended walls, and lodging in the tissue, rob the normal bioplasm of its nourishment. Or, if the obstruction becomes complete, the circulation of the blood is stopped, and thus the tissues are deprived of their nourishment. In either case, or from both causes combined, the tissues and vessels will lose their vitality, and soon disintegrate. This wasting of the tissues is common to all contagious diseases, and may proceed to any length. The capillaries of any portion of the body may be affected, and hence any organ or portion of the body may undergo the change. If the surface affected be limited in extent, neighboring healthy vessels and lymphatics may absorb the disintegrated tissue, leaving behind a wasted and imperfect texture. This remaining tissue may very likely prove incapable of performing its normal functions, and hence local paralysis and permanent impairment of different organs so often follow some of these diseases. In scarlatina we recognize a frequent cause of the more or less complete destruction of delicate tissues connected with the organs of sight and hearing. But if the alterations affect any considerable portion of the body, death invariably closes the scene.

Dr. Beale has recently published some studies of the alterations induced in the villi by cholera, which will repay careful examination. In portions of small intestine from different cases of cholera, villi are shown in every stage of wasting. In some the wasting has but just commenced, while others are wholly shrunken up, the

capillaries reduced to mere lines, and the tissue disintegrated. It is plain that a villus thus disorganized cannot continue to be an organ of absorption; and if a great extent of intestinal surface be affected, as is the case in severe attacks, "the effective absorbing area will be too limited to take up the quantity of nutriment required to maintain the body in a state of health and vigor. Nor should we be surprised that serious attacks generally prove fatal."*

Our subject, gentlemen, is so extensive that our survey of it has doubtless appeared to you both hasty and imperfect. But we trust that our remarks will impress upon you the importance of recent investigations in this field, and of the practical aid which we may hope to receive from them in the rounds of our daily practice. It is certain that the more we know of the nature of disease, the more successfully we may hope to combat it; and in the whole range of our science we know of no investigations which have done so much to acquaint us with the real nature of morbid action as those which we have discussed to-day.

*Dr. Beale. Disease Germs, their Real Nature, p. 59

ARTICLE XXX.

CHLORAL HYDRATE.

BY MOSES C. WHITE, M.D., OF NEW HAVEN.

Read before the Convention, May 2, 1872.

Among the new remedies furnished by modern chemistry, Chloral Hydrate holds a prominent place.

Its value as a therapeutic agent is too well known to require more than a passing notice. This compound is principally manufactured in Germany, and the quantity imported into England and the United States amounts to about forty tons annually.

Very little of this article is manufactured in the United States, yet we regret to be obliged to add that at least two large manufacturers of chemicals sell imported chloral hydrate put up in bottles labelled as though manufactured by themselves.

If the chloral hydrate were a drug of uniform purity as one whose purity could be easily tested, such a proceeding, though culpable, would be less injurious to the public than in the present case.

The wonderful effects obtained in some cases by the use of the chloral hydrate have caused a wide-spread demand, and it has been extensively used, not only under the immediate direction of physicians, but also in the form of self-administration, by patients who are too ignorant to fear to employ such a powerful drug in cases which are quite inappropriate.

As a consequence of this free and incautious use of the new hypnotic, many deaths have occurred, and we are called to inquire why, and under what circumstances, have these fatal results occurred?

To arrive at some reliable opinions we propose to inquire into the mode of manufacture of chloral, and ascertain what is known in regard to the purity of the samples in the market.

Chloral is formed by the reaction of chlorine gas upon absolute anhydrous alcohol. Alcohol consists of

2 atoms of carbon,
6 atoms of hydrogen,
1 atom of oxygen,
} = Alcohol = 46.

If 8 atoms of chlorine are added, 5 atoms of chlorine unite with 5 atoms of hydrogen forming muriatic acid, while 3 atoms of chlorine unite with the remaining ingredients of the alcohol forming chloral = C_2Cl_3OH, which is a liquid. If now one atom of water is added, H_2O, *i.e.*, 18 parts water to 147½ parts chloral, there is formed hydrate of chloral, which assumes the crystalline form. In theory, 46 parts of pure anhydrous alcohol should produce 147½ parts of chloral, or 165½ parts of the hydrate of chloral, or 192½ parts of the alcoholate of chloral. In practice, other compounds are formed, and a considerable amount, one half at least, is lost in the manufacture. Much of the chlorine employed fails also to be utilized and passes off as waste.

If, instead of water, alcohol is added to the chloral, there is formed alcoholate of chloral.

By some it is believed that this substance exists as an accidental impurity in the drug sold in commerce, and to this impurity are attributed the variable results obtained from chloral hydrate procured from different manufacturers.

Apparently the most reliable report of analyses of the various kinds of chloral hydrate found in the market, is contained in an article in the *British Medical Journal*, Feb. 4, 1871, p. 131, which is here transcribed almost entire.

"The paper published by Mr. Mason in the Pharmaceutical Journal, Jan. 7, 1871, was calculated to excite grave doubts as to the character of the hydrate of chloral now in use, and it appeared to favor the statement that has been made as to the *alcoholate of chloral* being in some cases sold in the place of *the hydrate of chloral*, that is to say, a compound of chloral with alcohol instead of the compound of chloral with water.

The very different *physiological* effects of these two substances render this question one of great importance, demanding the careful attention, not only of medical men, but also of the manufacturers of this article.

The test that has been adopted for the purpose of determining the relative quality of various samples of hydrate of chloral, is based upon the reaction taking place when ammonia is mixed with a solution of hydrate of chloral, heated in a closed tube and left at rest for some time. By this reaction the hydrate of chloral is converted into chloroform, which separates in an oily layer at the bottom of the tube, while formiate of ammonia remains in solution as a brownish watery liquid above it.

In a suitable tube the volume of the chloroform produced in the reaction may be measured off. Chemically pure hydrate of chloral treated in this manner yields

72.2 per cent. by weight of chloroform. By operating on two samples of the hydrate of chloral in this manner, the following results have been obtained:—

ANALYSES OF HYDRATE OF CHLORAL.

	Description of the sample examined.	Percentage of Chloroform produced.	Percentage of pure Hydrate of Chloral.
1.	White cake (Liebreich)	69.1	96.16
2.	Clear transparent crystalline lumps (Liebreich)	71.0	98.32
3.	Solid white cake (Marquart)	71.0	98.32
4.	Spongy white cake (De Haen)	69.4	96.19
5.	Acicular crystals (De Haen)	70.3	97.44
6.	Compact cake (Soames)	71.0	98.32
7.	Moist-like crystals, French make	71.1	98.44
8.	Tabular crystals (Uncertain)	64.8	89.91
9.	Small crystals (De Haen)	67.3	93.29
10.	Cake with yellow tinge (Uncertain)	62.9	87.07
11.	Pure hydrate	72.2	100.00

The first thing which is apparent in looking over these results is the great difference between them and some of the results given in Mr. Mason's paper. In no instance does the percentage yield of chloroform by weight amount to less than 90 per cent. of the hydrate of chloral examined. At the same time there are differences of quality in the samples; and this is rendered more evident by calculating out from the chloroform produced in each instance, as is done in column 4, the percentage of amount of pure hydrate of chloral corresponding to it in the several samples analyzed. While, therefore, it would seem either that the samples examined by Mr. Mason were very different from those above referred to, or that some error has crept into his experiments, it may be inferred from the results here given, that there is a variation of quality in the hydrate of chloral of commerce amounting in some instances to as much as 10 per cent.

As regards the alleged substitution of the alcoholate of chloral for the preparation originally recommended by Liebreich, it does not appear from the results above stated that it is practised to any great extent, if at all; but we purpose inquiring into this point more fully."

This statement of the percentage of hydrate of chloral in the different samples analyzed proceeds upon the assumption that the effective value of the drug for medicinal purposes depends upon the amount of chloroform it is capable of producing, i. e., the percentage is reckoned on the assumption that all the equivalents of chloroform produced in the analysis existed in the drug in the form of *chloral hydrate*.

Now if, as stated in this article, the *alcoholate of chloral* has a very different physiological effect from that produced by *hydrate of chloral*, it is evidently a matter of great importance to consider

whether the ingredients which in the analyses produced *chloroform* exist in the drug as *alcoholate of chloral* or as *hydrate of chloral*.

If we suppose or assume that there has been *no intentional adulteration* by other materials, and that the drug contains only *hydrate of chloral* mingled with *alcoholate of chloral*, the case will stand thus:—

Pure hydrate of chloral contains the ingredients to make, by decomposition, 722 parts of chloroform in 1000 of the chloral hydrate.

If then a sample called hydrate of chloral will produce only 673 parts of chloroform in 1000, as was given by analyses of the small crystals of Dr. Hare's chloral hydrate, the question is, what proportion of that drug was *chloral hydrate?* and what proportion was *alcoholate of chloral?*

According to the best chemical authority:—

Chloral consists of C_2Cl_3O |
H |

To which, if water is added, we shall have:—

Hydrate of chloral $= C_2Cl_3OH, H_2O = 165.5$.

$C = 12$, $Cl = 35.5$, $O = 16$, $H = 1$.

The chemical equivalent of hydrate of chloral $= 165.5$.

Alcohol $= C_2H_6O = 24 + 6 + 16 = 46$.

Alcoholate of chloral $= C_2Cl_3O.HC_2H_5O = 193.5$.

Chloroform $= CCl_3H = 12 + 106.5 + 1 = 119.5$.

$$165.5 : 119.5 :: 100 : 72.2$$

Hydrate of chloral will produce $\frac{72.20}{100.00}$ chloroform.

$$193.5 : 119.5 :: 100 : 61.76$$

Alcoholate of chloral will produce $\frac{61.76}{100.00}$ chloroform.

It thus appears that hydrate of chloral will produce 72.2 per cent. of chloroform. Alcoholate of chloral will produce only 61.76 per cent. of chloroform.

The percentage of chloroform produced by alcoholate of chloral is $10\frac{4}{5}$ per cent. less than the amount produced by the hydrate.

Applying these principles to the analyses above reported, we find:—

	Chloroform.	Ash.	Decomposed by water.	Alcoholate.	Chloral percentage by hydrate.
1. White cake (Liebreich)	69.3	1.1	30.70	29.6	70.4
2. Clear and transparent lumps (Liebreich)	71.8	0.4	28.52	4.2	95.8
3. Solid white cake (Marquart)	71.8	0.4	28.52	4.2	95.8
4. Spongy white cake (De Haen)	69.4	2.8	30.19	26.8	73.2
5. Acicular crystals (De Haen)	68.2	1.5	30.41	18.2	81.8
6. Compact cake (Rosse)	71.8	0.4	28.52	4.2	95.8
7. Moist-like crystals, fresh cake	71.2	1.1	28.44	16.5	83.5
8. Tabular crystals (Unverricht)	68.8	7.4	23.91	76.8	23.2
9. Small crystals (De Haen)	67.2	4.9	31.29	46.9	53.1
10. Cake with yellow tinge (Uncertain)	62.8	0.4	37.07	80.0	20.0
11. Pure hydrate	72.2	0.0	100.00	00.0	100.0

It thus appears, that if alcoholate of chloral should prove to be a more dangerous drug than pure hydrate, then many of the varieties sold in the market contain a truly alarming amount of the dangerous compound.

Pursuing our inquiries, to find out, if we can, how and why such widely different results are obtained, we notice, first, that while the best chemists manufacture chloral by passing chlorine gas through pure anhydrous alcohol, others make it from starch and other carbo-hydrates.

One chemist passes the chlorine gas through the alcohol only until a yellow color is produced, which requires but a few days; others, as Dr. Squibb of Brooklyn,* continue the process for four weeks, to obtain the highest possible chlorination of the compound, and to decompose all the alcoholate of chloral and convert it into chloral, which is afterwards hydrated by the addition of water.

J. Thompson separates the hydrate of chloral from other compounds by fractional distillation, preserving only the portion which distills between 110° and 115° centigrade, rejecting all that comes over at a lower temperature.

Rennie's chloral hydrate boils at 145° centigrade, Thompson's at 115° c., while that made by Personne boils at 96° to 98° c.†

In fact, so far as we can ascertain, the common method of separating chloral hydrate from other compounds of chlorine is by distillation, preserving only those products which evaporate at a temperature supposed to be characteristic of the chemical compound sought. While chemists differ so widely in regard to the boiling point of the compound to be used, is it any wonder that

* See Druggist's Circular, July, 1871.

† Quarterly Retrospect of Therapeutics and Pharmacy, July, 1871.

the market is supplied with chlorine compounds called chloral hydrate, differing greatly in their chemical properties and physiological action.

The tests for the purity of chloral hydrate are by no means certain and definite. Some test chloral hydrate by the action of alkalies. If the application of ammonia brings out a strong smell of chloroform, they accept the drug as tolerably pure and suitable for medicinal use.

In cold water alcoholate of chloral is nearly insoluble, while chloral hydrate is very soluble in water either hot or cold. From this fact it will be readily understood that chloral hydrate is very hygroscopic and deliquesces in moist air, while the alcoholate is but slightly deliquescent. In practice this test is of little value, for a mixture of the two would still appear hygroscopic even if it contained a large percentage of the alcoholate.

These observations, taken in connection with the startling fact deduced from a reconsideration of the English analyses of chloral, where I have shown a probability, if not certainty, that even Liebreich's chloral hydrate contains (some of it) near thirty per cent. of the alcoholate, and some samples from other makers 90 per cent. of the alcoholate, prove, as I believe, that it is to chemistry, and not to experimental physiology, we should first look in our efforts to discover the cause of the strange results and numerous deaths which follow the indiscriminate use of that *blessed angel of mercy*, HYDRATE OF CHLORAL.

Note.—The reader will find a pretty full statement of the known methods of distinguishing chloral hydrate from the alcoholate in the Quarterly Retrospect of Therapeutics and Pharmacy for July, 1871, from which some of these statements have been obtained.

Since this paper was prepared Dr. Squibb has announced in the Druggist's Circular for *July*, that there is no process of purification that in his hands has given such uniform good results as simple well managed crystallization. It results he much prefers it to the common method by sublimation, as the mineral impurities seem to be more easily and more perfectly separated.

When we remember that until quite recently even Dr. Squibb depended on fractional distillation to separate chloral hydrate from other compounds we cannot yet depend on the new departure to clear the market of dangerous compounds sold under the name of *Chloral Hydrate*.

MEMOIR OF

CHARLES WOODWARD, M.D.,

OF MIDDLETOWN

And late of the Baldwin County Insurance.

BY IRA HUTCHINSON, M.D., OF CROMWELL.

Charles Woodward, M. D., was born in Torringford, Aug. 16, 1788. He was the youngest of a family of eight children, six sons and two daughters. Their father, Dr. Samuel Woodward, was a practitioner of eminence in that town, and probably had a larger consultation business than any other physician in Litchfield County. He also owned and cultivated a large farm. Four of the sons adopted the profession of their father, so that at one time there were five members of the family qualified to practice medicine, the father and four sons: though one of the sons died of consumption, (a disease entailed upon the family by the mother,) before engaging in the active duties of the profession.

Of the sons who became practitioners of medicine, was the eldest, the late Samuel B. Woodward, who established himself at first in Wethersfield, and subsequently removed to Worcester, Mass., to take charge of an Insane Hospital there: and Henry Woodward, who located in Middletown. As it was not the intention of the subject of this notice to enter the medical profession, his means of education were limited to such as were furnished by academies, attending school winters, and laboring on the farm summers, until his 18th year. His original purpose had been to engage in the mercantile profession, but at the close of the war with Great Britain, in 1815, there was a great financial crisis, and he and his friends became alarmed and undecided as to his future course. In this state of suspense he concluded, by the advice of his father, to take up the study of anatomy as a science, and wait the turn of events. After studying four months in his father's office, he went to visit his brother in Wethersfield, who put him on a course of examination; and expressing his astonishment at

the progress he had made, he insisted that he should spend a year with him, and take up the other branches of medical science. He did so, but persisted that he should never practice the profession.

In this unsettled state of mind, he went to New Haven, and attended a course of lectures, but refused to take the necessary steps to obtain a degree. The next year, November, 1821, he was however persuaded by his brother to take a medical license. He then continued with him another year, assisting him in his practice, and reading in his office.

In the fall of 1822 a delegation from Windsor waited on him at Wethersfield, for the purpose of inducing him to establish himself in the practice of medicine in that town, the principal physician there having recently died. He visited the place, was pleased with the location, but hesitated. The next Sabbath a messenger was sent to request him to come up and take charge of some recent cases of typhoid fever, a disease then prevalent in that part of the State. He did so with the understanding that he would do what he could for those that sent for him, but would not pledge himself to remain. The result was that he was successful with these cases, and he continued to practice there more than ten years, doing quite an extensive business, and being called often for consultation in the neighboring towns.

On the death of his brother Henry, in Middletown, in 1832, he removed thither, and continued assiduously and laboriously to perform the duties of a practitioner of medicine for a period of thirty-seven years, and until suddenly interrupted by an attack of typhoid pneumonia, which speedily terminated in death, May 18th, 1870. There, also, he had a pretty extensive consultation business in the adjacent towns.

One feature of his professional life, too marked to be passed over in silence, was his ready response to all calls for his professional services, both by night and by day, with little regard to the state of the weather or the condition of the roads, or the state of his own health even; and also his exact punctuality in meeting his engagements when a time had been specified for making a visit, as in cases of consultation, neither anticipating the hour or falling behind it.

Ever prompt, assiduous and self-relying, his practice was characterized by energy, efficiency, and a high degree of success. He believed in the remedial power of medicinal agents, and fearlessly prescribed them. To the poor he rendered himself doubly dear

by his self-sacrificing labors in their behalf; cheerfully rendering more professional service, without hope of fee or reward, than any other in the circle of my acquaintance; often supplying them, not only with gratuitous medical attendance, but also furnishing them at his own expense many articles of food,—dishes prepared by his family, so necessary and comforting to the sick, and of which but for him they would have been destitute. By all such he will be held in lasting and grateful remembrance. He was never an advocate for a high tariff of medical charges. On one occasion, when the subject was under discussion in one of our meetings, he remarked that he had never oppressed the poor, and he believed that God would bless him for it. But his views and feelings on this subject will be best learned from the closing paragraph of his address before the State Society in 1868. "There is a sentiment prevailing among the members of our profession, that as a profession it is not duly appreciated, and for our services we are not properly remunerated. This may be true to a certain extent, but who has the affections of the community about him to a greater extent than the 'beloved physician?' When stricken down by sickness, whose premises are invaded by more anxious inquirers, or has more earnest prayers put up for his recovery? No one should enter the profession under the expectation of having a long rent roll, or a large file of certificates of bonds and stocks; if he does, he is doomed to disappointment. We should be governed by higher motives and nobler purposes; we should feel that we have entered a field where there is an opportunity of practically carrying out the precepts, and following the example of the 'Great Physician'; and inasmuch as we have lodged the stranger, given food and drink to the famishing, and visited the sick for the work's sake, we have followed his example and served him. For the poor we have with us always. The calls of the sick and needy for the physician's charities are inexorable. Though gold and silver we have not, if we have been faithful to our calling, may we not hope that we have laid up treasures where moth and rust do not corrupt, and thieves do not break through and steal!"

As evidence of his character and standing as a physician, I need only refer to the frequency of his calls to consult with his professional brethren, in cases attended with difficulty and danger; and to the fact that, on the recommendation of the President and Fellows of the State Medical Society, the honorary degree of M.D.

was conferred on him by Yale College in 1850; that he at different times held a position on several of the standing committees of the Society, and was elected its President in 1867.

Dr. Woodward was twice married; first to Miss Eliza Hills, daughter of Mr. Stephen Hills, of Windsor, Dec. 25, 1824, and after her decease in Jan., 1838, to Miss Ellen Maria Pratt, daughter of Capt. John Pratt, of Middletown, May 1, 1838.

By the former he had one daughter, and by the latter one daughter, who died in early childhood, and two sons. The second wife and the three remaining children still survive him.

As a citizen, Dr. Woodward felt a deep interest in whatever tended to promote the interests, both material and educational, of the people among whom his lot was cast.

In the early history of the temperance reformation, and while its friends relied alone on moral suasion, he was one of its earnest and active supporters.

The cause of education found in him an able advocate, and the people of Middletown are largely indebted to him, and to the late Hon. Samuel D. Hubbard and a few others, who met weekly at his house for the purpose of securing to the children and youth of the town the advantages of a high school; and the last speech he ever made in public was a few weeks before his death, at the dedication of the enlarged and improved edifice erected for its accommodation.

He was also for a long term of years a trustee of the Wesleyan University.

In politics he was a man of decided opinions, a prominent and influential member of the party to which he belonged, and was repeatedly honored by his townsmen with a seat in the House; and once by the 14th Senatorial District with a seat in the Senate of our State Legislature.

Precisely what were Dr. Woodward's religious tenets, I do not know. He was a very constant reader of the New Testament, rarely if ever retiring to rest without spending some time in perusing its sacred pages. The copy he used for that purpose has many passages marked as worthy of special consideration—such as the Lord's Prayer, Christ's sermon on the mount, and many others. In a letter to Dr. Catlin some 20 years before his death, he says, "I make it a point to read the New Testament through once a year. It appears to me to be a perfect revelation and comprehensible, but I cannot comprehend the interpretations put upon it."

And again he says, "The teachings and miracles of Christ, as recorded in the New Testament, show him to have possessed more than human wisdom and human power." His views, however, of some of the *practical duties* of religion may be learned from the closing paragraphs of the address already quoted.

By his sudden and unexpected death, and the death of Dr. Casey a few weeks previous, two prominent members of this County Society, and the still more recent death of Dr. Asa H. King of Saybrook, and Dr. F. G. Edgerton of East Hampton, how forcibly are we, and especially those of us who have passed the meridian of life, reminded of the brevity of life, and admonished "to do with our might what our hands find to do," in fulfilling the benevolent designs of our noble calling, since "There is no work nor device nor knowledge nor wisdom in the grave to which we are hastening."

MEMOIR OF

NATHANIEL SHAW PERKINS, M.D.,

OF NEW LONDON.

Read before the New London County Association,

BY ISAAC C. PORTER, M.D., OF NEW LONDON.

Nathaniel Shaw Perkins, M.D., the eldest of six children, was born in New London, Feb. 11, 1782. He was the son of Hon. Elias Perkins, ex-M. C., and Lucretia Shaw Woodbridge, a daughter of a former clergyman of this town. She is represented as a fortune in herself, and moreover, was heir to a large estate from her uncle, Nathaniel Shaw, an eminent merchant of the last century, and a warm friend and supporter of the revolution. The subject of our sketch also enjoyed the happy auspices of judicious maternal influence. Within a year of his death, the writer was sitting by his bedside, in the old Shaw mansion, which had reverted to him, and in a chamber still memorable as having been occupied at different times by Washington and La Fayette, when, our conversation turning on his past life, pointing to the embrasure of a window, he said: "How well I remember, when a boy, playing truant one Sabbath morning; a servant soon found me, and brought me to my mother, who, in her faithfulness, took me into this room, and there kneeled and prayed with me, adding that she expected soon to die, but she hoped that when she was gone I would be a good boy." She died within a few months after, of consumption. A pleasant memory of a sainted mother! and who can declare its influence through the many years that had intervened?

He prepared for college under the instruction of (Rev.) "Master" Adams, a famous educator of the time, and father of Rev. Dr. Wm. Adams of New York, graduating at Yale in 1812. Commencing his medical studies in this city with Dr. Elisha North, of "spotted fever" memory, he completed his course preparatory to entering the profession at the University of Pennsylvania, and was licensed to practice by the Conn. Medical Society, receiving the degree of M.D. from Yale College in 1828. Thus prepared,

he entered upon the practice in 1815, continuing in it for a period of fifty five years, visiting patients within four days of his death.

Few, in those days, commenced practice under circumstances so favorable. A moderate capital contributes as much to the ultimate success of the young physician as of others starting in life. Inheriting a fortune, or the prospect of it; a home beneath his father's roof; social advantages and extensive family influence—all these, if they do not paralyze effort as unnecessary, must aid honest and hearty endeavor. He was willing to commence at the lowest round of fortune's ladder; was grateful for small favors, happy to visit the poor with little or no hope of recompense, and if the case required it, to supplement his advice with a bottle from his father's wine-cellar. Visiting a patient exceedingly and urgently ill on Plum Island, twenty miles distant, in a violent storm, and thus saving her life,—generous, energetic and brave as was the act, is it strange that his popularity grew apace? A "good start" thus attained, success in his calling gave him a love for his profession and a love for work.

Early married to an estimable and attractive lady (née Miss Ellen Richards), he had the rare felicity of more than fifty years of married life; and five children still live to mourn their loss.

A late writer on "hereditary genius" says: "To constitute a man of mark in his generation, he must possess *intellect*, *zeal* and *power*, physically, to *work*." If under intellect and along with it, we include, as belonging to the character before us, tact and personal manner, which in some sense have their basis in the mind, we may follow this three-fold division in our present estimate.

His mind was practical and objective; his knowledge of human nature ample, as was his tact and skill in using it, and he doubtless acted wisely in the choice of his profession. He had that nice perception which leads us so to regulate ourselves and actions as to secure our ends and purposes. In this he was much aided by a happy manner, which to a physician, as all know, often becomes a fortune in itself. Courteous, genial, affable, he had a word and a smile for all. If he was ever harsh and severe, it was at the false claims of irregular practitioners and traveling pretenders. By the bedside of the sick, the hope and comfort which his presence brought was quite remarkable. He had much control over his countenance, lest it should betray, to friends or the patient, more than was meet. The writer remembers consulting with him in the case of an only daughter, whose life was in great and

momentary jeopardy. "Here," says he, "I have been, all day, smiling and jesting with her nervous and sensitive mother, whose all is at stake, while my heart is aching for her." His powers of perception were good, and his diagnosis of disease, though often apparently almost intuitive, generally accurate. Like our own Todd of Hartford, a genius well known to our predecessors, he had a bias and attachment to tonics, stimulants and supporting measures generally, long ere they had attained their present popularity.* As an item in his medical history, he informed me that, in his practice, he had been professionally engaged in thirteen cases of *placenta previa*, without loss, in any case, of maternal life.

But tact and talent are not all that is requisite. There must be energetic effort, a warm interest in the object of pursuit, which shall secure activity, perseverance and earnestness in the business of life. This constitutes *zeal*; and that he possessed it, is shown by his life of industrious devotion to his profession; and we shall only add on this point, that he was never, seemingly, more happy than when, sacrificing his own quiet and comfort, he could alleviate the sufferings of others.

According to the laws of "hereditary tendencies," he was doomed to an early grave; his maternal grandfather, grandmother, mother and sister all having died of consumption. But he outlived the expectations of all, a result traceable mainly to his active, cheerful life in the open air; and conforming, practically, to his saying: "Live well and work hard." He was also a sportsman and a "good shot," and in the days when game was plentiful, he kept consumption at bay, in perhaps the most effective way, by traversing our fields and woods, in the intervals of business, with dog and gun. He thus lived to be almost an octogenarian.

During a large portion of his life, he seemed to share in unusual measure the blessings and enjoyments of earth; but at length reverses came in the loss of children in adult life (one, an officer in the late war, honorably killed at Kinston, N. C.), and in pecuniary embarrassments, which made serious inroads upon his fortune. But elasticity of spirit and manly resignation remained, and he cheerfully resumed a practice which he had partially relinquished.

In 1819, while in the morning of life and of worldly prosperity,

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* Suffer me to say in passing, that Todd never used stimulants in disease with the freedom of his English namesake. Strictly temperate himself, he could tell by intuition, as Tully informed me, when a patient had been even moderately addicted to the use of alcohol.

he made a profession of religion, uniting with the First Congregational Church in this city. He was an early riser; and the writer has more than once found him, in the dawn of the morning, perusing the pages of the Bible, or of medical literature. "This," said he, "is my period for meditation and for professional reading." This circumstance would scarcely deserve mention, were it not conjoined and supplemented by a life of integrity and of conformity to the divine law. He contributed liberally towards the erection of churches in this city and elsewhere; was charitable to the poor, often giving advice gratuitously, which was worth more than money. "He entertained a high sense of commercial integrity and honor," says one who knew him well, "and commanded, even in the most trying circumstances, the respect and confidence of all with whom he had any business relations."

It only remains to speak of his sickness and death. Returning, on one occasion, fatigued and chilled from visiting a patient in the country, he entered his house to go out no more. A cough arising from chronic bronchitis had previously become more troublesome, and now pneumonia supervened; and in four days he passed away, dying in the professional harness, May 25, 1870, aged 78 years.

He was a representative of a class in our profession whose usefulness, in the mass, more than equals that of some of far wider reputation and greater renown.

His end was peace; and there was, in the minds of survivors, a sense of fitness and of completed harmony, that so long and fruitful a life had reached so round and perfect a close.

MEMOIR OF

RICHARD P. TRACY, M.D.,

OF NORWICH.

BY ASHBEL WOODWARD, M.D., OF FRANKLIN.

Within a brief period the mortality among the older and more distinguished members of our profession has been unusually severe and painful. We are now called upon to chronicle the death of another, who by his peculiar cast of mind and originality of character filled a marked place in the circle in which he moved. Dr. TRACY belonged to a family which has been eminently distinguished in the history both of the State and the country. He descended in the fifth generation from Lieut. Thomas Tracy, one of the original settlers of Norwich. His grandfather, Dr. Elisha Tracy, who graduated at Yale College in 1738, practiced medicine in Norwich for many years, and his father, Dr. Philemon Tracy, adopting the same profession and remaining in the same town, practiced medicine over fifty-five years, being particularly noted for the thoroughness of his investigations and the accuracy of his judgment.

Dr. RICHARD P. TRACY died on Friday, March 17, 1871. Had life held out till the 21st, he would have reached his eightieth birthday. Early destined for professional life, he was permitted to enjoy rare advantages, under the fostering care of his father, both in his office and in the sick room. He graduated in the medical department of Yale College in the Class of 1816. Following the example of several of his ancestors, he settled in his native town, and for nearly three-fifths of a century obeyed the calls of his profession. Courteous, benevolent and humane, he performed a large amount of gratuitous labor among the poor, who always found him ready to give his assistance in distress.

Perhaps the most striking accomplishment of Dr. Tracy, and the one which most impressed his contemporaries, was his intimate acquaintance with the text of the Scriptures, of Shakspeare and other English classics, and the aptness of his quotations

Many of his repartees, both original and drawn from the above sources, expressed in his quaint and emphatic manner, have long been current in his native town, and will probably continue to be quoted with enjoyment long after the last of his associates have passed away. He had a large acquaintance, too, with history and general literature, coupled with a peculiar fondness for personal anecdotes and reminiscences.

Dr. Tracy never married, and thus ends in Norwich the line of medical succession in that family, which, commencing with Dr. Solomon, fifth son of Lieut. Thomas, and grand uncle of Dr. Elisha Tracy, continued for one hundred and eighty years. As a companion, he was always entertaining and suggestive. His kindly and genial disposition secured for him the hearty good will of the community, and he died, as he had lived, universally beloved.

MEMOIR OF

HENRY HOLMES, M.D.,

OF HARTFORD.

Read before the Hartford County Association

BY C. W. RUSSELL, M.D.

My first acquaintance with Dr. Holmes was in the spring of 1833. He was then occupying rooms at Mrs. Lynch's, in the Bangs house, on State street, and the appearance which he then presented is still fresh in my mind. Erect and well proportioned, his face florid and beaming with health, his manners easy and pleasant, his dress, of blue cloth, exceedingly neat and well fitting, and his great cordiality, combined to make a picture which is well remembered.

Henry Holmes was born in Litchfield, on the 14th day of February, 1795. He was the son of Hon. Uriel Holmes, of the same place, a gentleman of considerable social and political standing. Before he was thirteen years of age, he was admitted as a member of Yale College, but on account of his youth and delicate health, was not able to proceed with his class. He had pursued his studies at Litchfield, and afterwards continued them at the academy in Sharon. But his attention was soon directed to business pursuits, and he was for some years in the store of William Watson, in this city, under whose careful direction he learned habits of accuracy and attention to the minute details of business, which he said were of much importance to him in after years.

"After leaving Mr. Watson, he spent some time in a mercantile house in New York. His father being an extensive owner of lands in Ohio, he was sent thither as a surveyor, and did survey and lay out the township of Litchfield, which at the time was thickly covered with wood, and from fifteen to twenty miles from any settlement. The months which he spent here, living in a log cabin erected by his party, and subsisting upon the simplest fare, he has often told me, were in some respects the happiest of his life."

But the nature of our friend was too refined for such employments and associates, and we find him commencing the study of medicine in Litchfield in 1822, and after attending three courses of lectures in the Medical Institution of Yale College, he received his degree of Doctor of Medicine in 1825. Under the able instructors in that school, he acquired a good knowledge of his profession and of its great dignity and importance.

In the autumn of this year he commenced practice in Durham, and for nearly two years followed it with great zeal, industry, and success. His ambition was stimulated more, probably, than ever before. The encouragement of friends, and the opposition of rivals, led him to devote himself to business with an earnestness which ensured success; and perhaps having led a somewhat restless life, he had come to remember that he must be the architect of his own fortune, and so to show to his father, whom he reverenced, that his teachings had not been lost on a devoted son. Here he was diligent and faithful in his business, buoyant with hope, pleased with his success, and charmed with his many friends. How often, in after years, he referred to this old town, and the happy time he spent there, many of us can remember. It was with the greatest pleasure that he referred to this or that event as having occurred when he was in Durham,—that when in Durham such or such a case had been treated by him, the minute details of which were still fresh in his memory.

Whilst our friend cherished such pleasant recollections of this old town, and of the acquaintances which continued through life, he still remembered with too much faithfulness the annoyances and vexations which attend our profession. His sensitive nature would regard as of importance what many would consider as but trifles, and then again he did not fully understand, or did not realize, and never did realize, why the public did not always submit to the teachings of a well instructed physician, or how it was possible for it to be humbugged by the veriest pretender. Such men as he was pass through life with the highest perceptions of duty, and with the noblest intentions in action; striving to act with honor themselves, they expect to meet with honor in every man, and too often judge of the mass by individuals. But if our friend was occasionally subject to such dispiriting feelings, they were of short duration, and his natural cheerfulness soon rendered him happy again.

The death of his father, and the time necessary to settle his estate, led to the suspension of his practice in Durham. But we

find that he attended a full course of lectures, and received his diploma from the College of Physicians and Surgeons in New York city in 1831. He here attended at the New York Hospital, and, removing to Hartford in 1833, again commenced his practice. At one time he did considerable business, and in the earlier years of his residence here always attended upon calls. With a competence sufficient for his support, he did not then feel those incentives to persistent exertion which are stimulating to many.

During his residence here, he filled various positions in the public service. He was for many years, and at different times, physician to the town, and fulfilled its duties with great honesty and acceptability. For a long time he was chairman of the Health Committee, and for the latter years of his life was the coroner of the city. In both of these positions he gave the greatest satisfaction, and, more than this, discharged his duties with the greatest honesty and impartiality. Nothing gave him more pleasure than to know that the city was cleanly in its appearance; and if his requirements, or the necessities of the law, failed to meet with a hearty response, he could hardly understand how it happened that any one would not give him his cordial support in measures which were for the general good.

Dr. Holmes was one of the original members of this society, and exceedingly enjoyed its meetings, deriving, as he often said, great profit from them. He was very punctual in his attendance, and lived fully up to the letter and spirit of its regulations. The very soul of honor himself, he viewed with abhorrence everything which was not truthful or anything which pertained to trickery. Consequently, he was known as a man who was reliable in upholding the honor and integrity of the profession. If at any time he felt it necessary to condemn, he yet did it with so much of charity as to remove all suspicion of prejudice.

In some respects Dr. Holmes was a peculiar man. Living the single life he did, it is not to be wondered at that he acquired peculiarities; but they were generally so innocent, of no harm to any one, and then so plainly the natural result of his original nature, and his subsequent position, that no one could seriously complain of them. And then his kindness of heart was so great, and his straightforward honesty of purpose so apparent, that all his faults or complaints were easily forgiven.

I should not do justice to my friend, if I failed to refer to his exceedingly gentlemanly manners. He was polite, almost to a fault; his unselfishness made mindful of the comforts or rights of

others to the neglect of himself, and his politeness was genuine: there was nothing artificial about it; it came from the heart, and so it came naturally. His good nature was sometimes abused, and his generosity unjustly invoked; but his simplicity led him to suspect nothing of usury, or to refuse when it was possible to comply. This very easiness of disposition led to the establishment of some habits in his early life which were the cause of intense sorrow to himself and of great grief to his friends; but we rejoice to know that for a long time they were of a most exemplary character. It was a great triumph for him, accomplished only by daily and prayerful resolve.

He entered political life as a federalist, was for a time an ardent politician, but of late had acquired more liberality in his views, and generally acted with the democratic party. As his early associations tended to the formation of his political opinions, so they did also to his religious views; but for some years he was a devout attendant at Christ Church, and often regretted that his early training was such that he was not a communicant of the Church. But religious sentiments were deeply planted in his heart; he knew what was right, and he wished honestly to do it; and if he failed in this, no one was more sincere in repentance. I say this, for I knew him, and know how profound were his religious convictions and how deep was his sorrow.

The chief points in the character of our friend I have endeavored to portray, and take pleasure in bearing testimony to his many good traits. A familiar acquaintance for thirty-five years led me to know him well, and how much there was in him to admire. He was eminently social in his disposition, and enjoyed exceedingly the visits of his friends. He was partial to amusements of an innocent character, but his gentle nature was not pleased with rude or boisterous conduct. He was a good reader, and possessed of much information, and, until his eyes began to trouble him, enjoyed exceedingly the companionship of his books.

For a few months before his death his health began to fail, and his anxieties naturally increased. He gradually failed, and on the 31st of July last he died.

It was a pleasant summer day in August when we buried him, where he desired to be buried, by the side of his father and his mother. A few friends only were present: he was the last of his race. But when he was laid in the ground, the sods covered the body of a true gentleman, and all felt they had lost an honest man.

MEMOIR OF

F. G. EDGERTON, M.D.,

OF EAST HAMPTON.

Read before the Middlesex Family Association

BY A. E. WORTHINGTON, M.D., OF MIDDLE HADDAM.

Francis Griswold Edgerton, M.D., third son of Simeon and Lucy Griswold Edgerton, was born in Norwich, Connecticut, on the 23d of March, 1797, and died in East Hampton, in the town of Chatham, Conn., on the 2d day of November, 1870. Age, 73 years 7 months and 9 days.

He received his preparatory education in Norwich, and also read medicine with Dr. William P. Eaton of Norwich. Soon after he graduated, he located in East Hampton in 1821, succeeding the late Dr. Charles Smith, who removed the same year to Middle Haddam society in the same town.

Dr. Edgerton remained in East Hampton until his death, nearly forty-five years.

November, 1824, he married Miss Marietta Daniels, who survives him. They had but one child, a son, Francis D. Edgerton, M.D., of Middletown.

Dr. Edgerton, during his long practice, enjoyed the confidence of the public to a very great degree, and possessing, as he did, strong physical powers, seldom if ever losing a day by sickness, he was well known, and always expected at his post.

For more than twenty-three years Dr. F. G. Edgerton and the writer of these lines stood shoulder to shoulder, practicing in the same town, often meeting at the bedside, and many times having each separate patients in the same house without having any difficulty, and never meeting otherwise than as warm friends. But now we have met for the last time in this vale of sickness and of

suffering; and my prayers to Almighty God is that, through his mercy and the merits of his dear Son, I may be permitted to meet him in that world where there is no more suffering, and where the weary are at rest.

In eulogizing our friends, it is said, we are apt to leave out of sight their failings. But it can hurt no one's feelings, however sensitive they may be, if I mention all failings I have seen in the subject of this sketch, for like Goldsmith's village preacher, "even his failings leaned to virtue's side." "Indeed, I have often thought of Dr. Edgerton when reading the "Deserted Village." "A man he was to all the country dear." Again, "To relieve the wretched was his pride," and all the pride he ever showed. He was the same unassuming Nature's nobleman, and one of the old school. All of every age loved and respected him. To his medical brethren he was ever courteous, affable and kind. If he ever had occasion to quarrel with, or be jealous of, any one, it was with the writer. Coming, as I did, into his vicinity in the prime of his life and manhood, if I succeeded, I should of course take a part of the practice that would otherwise fall to him. He received me kindly, aided me the most he could, and was to me a father rather than an elder brother.

As I look back, I consider the hours spent in his company as among the most profitable as well as the most pleasant of my life. His conversation was entertaining and instructive. Having an extensive practice, he had but little time to read; he would improve every opportunity to converse, and he had a peculiar faculty to draw from others what they had read. He retained remarkably what he had read, and had a great fund of anecdotes to illustrate his remarks, and to cheer the desponding. He was, in the early part of his practice, cotemporary with the late Dr. Watrous of Colchester, who was a prominent member of the State Medical Society, and for whom Dr. Edgerton had great respect. Many, very many, anecdotes and incidents in the life of Dr. Watrous have I heard Dr. Edgerton relate.

He had strong physical as well as mental powers, being capable of enduring a great amount of fatigue; he would keep himself at work far into the night, never showing any impatience or haste to get home to his rest. His constitution or temperament required but a few hours sleep in the twenty-four, and if he lost that little he would not refuse to work as long as there was work to be done. He had his peculiarities, and one was never to seem in a hurry,

even when he knew many were waiting for him very impatiently in different directions. His rides were long, but none called him a fast driver until they tried to follow him on a long drive over the hills. Many have come home after such a chase with much less exalted opinions of their own favorite steeds. Another peculiar trait of his character was that he never would forget or give up an appointment, however long it might be before he could arrange his business to attend to it. I have known him make an appointment for the next day, and in one week from the day set would appear with a valid excuse to know if he was still wanted.

The greatest injury he has ever inflicted on his brother physicians was in instructing people, by his charges, to believe that we could live on little or nothing. His charges were extremely low, and the next fault (I must confess I am equally guilty), he was very slack in collecting his fees. This was not from any indifference about money, for he was very prudent in spending his money. His frugality was a subject of remark by his acquaintance. His low charges were the result of his unselfish disposition; a desire to live up to the golden rule. It was not that he did not like money, but that he felt that others would dislike to part with it as he did.

Dr. Elgerton continued to practice until the 24th of September, although he had suffered very much for some weeks previous with a severe pain in the region of the heart, which would sometimes stop him as he was entering the house of a patient, and almost take his breath. Yet he worked on until his wife and son almost compelled him to stay at home. He and his family had for some time been aware that his heart was diseased, and that his earthly career was liable to terminate suddenly. He approached death as he had done everything through life, calmly and with unfaltering steps. He received the summons as one who had done and well done his work, and "like one who wraps the drapery of his couch around him, and lies down to pleasant slumber."

As a proof of the high esteem in which he was held by the community where he lived, we have only to refer to his funeral, the largest ever known in the town on a working day. The most commodious house in the place was filled to overflowing, the seats, the aisles, and porch were full; not from idle curiosity, not that any great display was expected; no secret society was expected there in regalia. No; this industrious people had left their shops and their farms to pay their last respects to the memory of a dear friend.

In looking through that crowd of faces, I could not reckon a dozen who were not mourners. All belonged in the place assigned for mourners. That old man, whose locks are white as snow, who for the last forty-five years had looked to Dr. Edgerton for relief whenever suffering from bodily ailment, and had always found the same sympathizing friend—was not he a mourner? That poor old African, who came hobbling up the aisle on his crutch, and who had hobbled miles that day to look once more on that honest face which had so many times cheered and relieved him in his suffering—was not he a real mourner? Those fathers and mothers, who had so often had that form beside them, cheering them and bearing their burthens through the long hours of the night, when their dear ones were tossing on beds of sickness—were not they mourners? Those little boys and girls, who had often looked with impatience to see his sulkey come rolling on, who have so often smiled when he appeared—were not they mourners? Aye: they needed not black to show their sorrow.

MEMOIR OF

JULIUS STEELE BARNES, M.D.

OF SOUTHINGTON.

Read before the Hartford County Association.

BY F. A. HART, M.D., OF SOUTHINGTON.

Julius Steele Barnes was born in Tolland, in this State, Feb. 23, 1793. His father, Jonathan Barnes, a native of Southington, graduated at Yale College, and after studying law, married Miss Rachel Steele, an adopted daughter of the Rev. George Colton, of Bolton, and settled in Tolland, where he remained permanently up to the time of his death in 1829. His widow, and four sons,* and a daughter, survived him. The sons were educated for the learned professions of law and medicine. Jonathan Barnes, the eldest of them, was a learned and distinguished lawyer in Middletown, and died there in 1861. William Barnes, also a lawyer, learned and distinguished, is settled at Waterbome Point, in East Windsor. Josiah Barnes, the youngest, is a physician in the City of Buffalo, New York. The only daughter in the family, Eliza Barnes, married Doctor Alanson Alde, of Litchfield, and died there in 1837.

Julius Steele Barnes graduated at Yale College in 1813. After graduating in arts, he commenced the study of medicine in New Haven, and attended in connection the courses of lectures in the Medical College, where, in 1818, he received the degree of Doctor of Medicine, at the age of twenty-six. The same year he commenced the practice of medicine in Southington, in this State, and three years after, Nov. 1, 1821, married Miss Laura Lewis, daughter of Selah Lewis, a thrifty farmer, and a native of the same town. He continued in Southington in active and generally successful practice, except when prevented by ill health or recrea-

* Randolph Barnes, a book-seller, died in Pittsburgh, Penn., in early manhood a few years before his father.

tion, which was very seldom, nearly up to the time of his death, which occurred Nov. 11th, 1870, in the seventy-eighth year of his age. Three sons and four daughters survive. The eldest son, Lewis Barnes, graduated in arts at Yale College, and in medicine at the Medical Department of Buffalo University. He is married, and settled in Oxford, in this State, where he has a large practice. The second, Julius Barnes, is a merchant at La Porte, in Indiana. The youngest son, John Barnes, is an intelligent farmer, occupying the homestead of his father. The oldest son in the family, Randolph, died in California in 1849; and the youngest, William, in early infancy. The two oldest daughters are married and settled, Laura Whittlesey in Southington, Mary Day in Bridgeport. Catharine and Eliza Barnes are unmarried.

Dr. Barnes was more than an ordinary man, both physically and intellectually. In person, he was above the medium height and size, of a dark complexion, with strongly marked features, erect, stately and imposing. His mind, naturally superior, was strong and comprehensive. It was remarkable for its individuality, as well as force of character. It saw and heard every thing through its own eyes and ears, and viewed them from its own standpoint. Temperate in his habits, honest in his dealings, conscientious in his duties, virtuous in his morals, and possessed of common sense and good judgment, he was a safe man to be trusted. As a physician of long and large experience, he was self-reliant, intelligent, energetic, discriminating, prudent, and judicious. He was no charlatan. Quack doctors he abhorred. With the members of his own profession he was cordial and honorable, and delighted very much to seek them out and enjoy their society. With the affairs of the town and of the State he was much interested, and in both he has occupied important positions. Once, in 1819, he had the honor of being elected Senator from the First District. During the last year of the life of Dr. Barnes, his health rapidly declined from his increasing infirmities, attended with a formidable train of untoward symptoms, followed by chronic diarrhœa and dysentery, which terminated in a general dissolution of the whole system. During the last few weeks of his sickness, the writer attended him, and found him patient and resigned, except, occasionally, during paroxysms of very severe pain, when not sufficiently under the influence of medicine. Dr. Barnes made a public profession of religion, and united with the First Congregational Church in Southington in 1834. He died,

as he had lived, strong in the faith and love of Christ, and in the hope of eternal salvation and glory in the world to come.

Thus another of our number has passed away. Sooner or later, we, too, shall pass away. Time is ever on the wing. What is our life? It is a vapor that appeareth for a little while, and then vanisheth away. May we

> "So live, that when our summons comes to join
> The innumerable caravan, which moved
> To that mysterious realm, where each shall take
> His chamber in the silent halls of death,
> We go not, like the quarry-slave at night,
> Scourged to his dungeon, but sustained and soothed
> By an unfaltering trust, approach our grave
> Like one who wraps the drapery of his couch
> About him, and lies down to pleasant dreams."

MEMOIR OF

CALVIN B. BROMLEY, M.D.

OF SCOTLAND, CONN.

BY T. MORTON HILLS, M.D.

The subject of this brief sketch was born at Lisbon, in this State, May 14, 1810. He early evinced a love for books, but his father, a poor but honorable farmer, with a family of ten children, was unable to give him more than a common school education. While teaching school, he acquired a good knowledge of Latin and Greek; and soon after being of age, commenced the study of medicine with Dr. Wm. Witter of Willimantic. He attended his first course of medical lectures in the Medical Department of Yale College.

In 1835 he took the degree of M. D. from Williams College, Pittsfield, Mass., and early in the fall of the same year settled in Scotland.

In 1837 he married Mary Ann Taylor, only child of Daniel Taylor, a resident of Scotland. He had three children—two sons and one daughter. The youngest son, D. Taylor Bromley, adopted the same profession, and is now practicing in Hartford, Conn.

In person he was of average height—inclining to stoutness—and of a florid complexion. Both socially, professionally, and in his family, he was kindly, considerate and unselfish. He was faithful to his patients, and in his intercourse with his professional brethren he was governed by the strictest principles of honor and integrity.

He had been President of the County Medical Society, and often represented it as Fellow to the State Society. He took a lively interest in the county and State meetings, and was very punctual in attendance.

He was prominent in town affairs, and politically he represented the town of Windham (before Scotland was set off) in the Legislature in 1843 and in 1847—and was a member of the Senate from his district in 1863. It was soon after his return from Hartford

that he was prostrated by the first apoplectic stroke. After several months he was able to resume practice, and continued it till the spring of 1870, when he was again stricken down by the same disease. He lingered till the 17th of July, when he passed quietly from his family and a field of labor, where for thirty-five years he had been a faithful physician.

A large number of physicians were present at the grave to pay the last tribute of respect to a fallen brother.

MEMORY OF

HIRAM HOLT, M.D.,

BY GEORGE CHANDLER, M.D., OF WORCESTER.

SUBMITTED BY J. HARRIS, M.D.

Dr. Hiram Holt died after a short but painful illness, Nov. 30th, 1870, in Pomfret, Conn., where he had successfully and acceptably practiced his profession for nearly fifty years, in the 73d year of his age. He was born in what is now Chaplin, Conn., January 31st, 1798, on Orchard Hill, in a stony barren spot where his father Nehemiah Holt was born, and where his grandfather Nehemiah Holt had lived and toiled. Dr. Holt was one of the sixth generation from Nicholas Holt of Andover, Mass.; through Henry Holt, George Holt, who removed to Windham, Conn., 1726; Nehemiah Holt, who located on Orchard Hill, the grandfather of Dr. Hiram Holt.

He was the seventh of fourteen children, and the oldest son of his father, and it was but natural that he should be brought up to industry and economy on a spot where unremitted toil was required to procure a living from the soil. The habits then formed of the useful rather than the ornamental, abided with him through life. He early acquired the use of joiner's tools, which aided him in after life in his surgical operations, and are apt in keeping in working order many things about a country physician's establishment. He kept the district school in his neighborhood winters. At the age of about 23 he began to read medicine; and in July, 1821, he went to Pomfret, Conn., and entered the office of Dr. Thomas Hubbard, the celebrated surgeon for all that region for twenty miles round, and who drew to him the young medical students of Eastern Connecticut. People who remember Pomfret and its vicinity fifty years ago, will recall to mind Dr. Hubbard riding along rapidly in his sulkey, followed by such students on horseback as George Sumner of Abington, Samuel McClellan of Woodstock, Gary of Pomfret, Hiram Holt of Chaplin, and others.

Those were lucky horsemen who could ride up by the side of their master's saddey, and hold conversation with him upon the cases they had been visiting, and in getting his opinions thereon, and enjoying his many anecdotes.

Dr. Holt attended a course of lectures at the medical school in New Haven, Conn. At that time Dr. Nathan Smith filled the chair of surgery, who had the happy faculty of inspiring his pupils with enthusiasm for his special department.

Dr. Holt ever after loved to speak of Dr. Smith, of his ingenuity, of his skill, and of his success in surgery.

He immediately returned to Pomfret, and offered his services to the people of that town. He boarded at first with Dea. Job Williams. Many said it was presumption in him to think of getting anything to do in his profession there, for Dr. Thomas Hubbard had the confidence of the whole community, and that his brother Dr. Benjamin Hubbard was there to do what little he could not do. But Dr. Holt knew that Dr. Thomas Hubbard was often away on long surgical trips, and that Dr. Benj. Hubbard was unstable in his ways. Soon Dr. Holt was riding over Pomfret hills at the call of the sick on his black horse, as many remember, and he was duly appreciated. In the summer of 1829, a most malignant type of typhus fever came upon the good people of Pomfret. About forty cases occurred of such a character as had not been known in the vicinity. Dr. Holt sought aid from older medical gentlemen in the community; they advised the old Sangrado practice which had been taught here.

Dr. Hubbard had accepted the chair of surgery at Yale College. Although educated to the use of the lancet in all fevers, and the drastic purgative, Dr. Holt said neither of them would do in cases like these. He resorted to alterative tonics early, and strong stimulants freely, which practice was successful in its results.

The next year was followed by the same epidemic, and by a like number of cases. These two seasons were among the most laborious of his life. Since that day the use of the lancet and drastic purgatives have been little used comparatively at the hands of Dr. Holt. In the practice of medicine he was careful and judicious. He discriminated accurately by the symptoms, and prescribed such remedies as he had by observation found efficacious in like cases, his memory of his cases being very tenacious. In surgery, he was expert in detecting deep seated matter, neat and handy in bandaging and dressing wounds, and in operations

he was most happy in having a keen eye, calm feelings, a steady hand, and a reliable mind. Just two weeks before his death he amputated the left arm of Mr. Martin, the station master at Putnam, which was crushed by the car, to the acceptance of the surgeons present, as he did forty years previously an arm in presence of the late Dr. Bowen of Thompson, the writer of this, and others. After Dr. Hubbard went to New Haven to reside, the surgery of the vicinity fell into the hands of Dr. Holt and Dr. Bowen of Thompson, and the early death of Dr. Bowen left it almost all in Dr. Holt's hands.

When the occasion required it, his duty and ambition in that line of his profession, and his abundant qualifications, enabled him to perform skillfully and well. Dr. Holt was the good physician, kind of heart, ready to go, lenity in the sick chamber, and devoted to his calling. He gained the confidence of the sick by his candor, honesty and sound discretion.

As a citizen, he was faithful to duties entrusted to him, honest and capable in the execution of them. He was hospitable, reliable in any emergency, and kind and peace-making as a neighbor. He made no enemies, and if any there were, they made themselves so. His friends were many, as the crowded meeting house at his funeral testified, and the cordial sympathies of many to his family after his decease bare witness.

Dr. Holt was a superior man, mentally, and would have succeeded in any walk in life with his industry, economy and honesty of purpose. Pomfret lost in his death one of her most useful citizens, and the vicinity one upon whom they could rely with safety in the hour of sickness.

Although he was for years afflicted with rheumatism, incident to his habits and his profession, he was an active man, industrious always, and inclined to study when not otherwise engaged. It is believed the town bestowed upon him whatever honors and offices he would receive. The Connecticut Medical College conferred the honor of M.D. upon him in 1837. He received a license from the same College in 1851. Dr. Holt considered himself most happy in the two partners of his domestic life, and his three children rise up and called themselves blessed in having had such a father.

MEMOIR OF

ELEAZER B. DOWNING, M.D.,

BY REV. M. HUNT, OF PRESTON CITY.

PRESENTED BY ISAAC O. PORTER, M.D.

Dr. Eleazar B. Downing was born in Canterbury, Dec. 15, 1786, and died in Preston City, Jan. 20, 1870. He pursued his professional studies with the late Dr. Fuller at Plainfield, and at the Medical Institution, Philadelphia. He commenced the practice of medicine in Boston in 1811, and continued it until a few months before his death. He married Miss Lenin, daughter of the Rev. Tyler Preston. During the war of 1812 he was surgeon in the army. As a physician he had rare skill in detecting and analyzing the causes of disease, of coming to the knowledge of all that could be known in the case, and then his prescriptions were designed to meet it fully, and no more than thus meet it; hence, while most prudent and safe, still thorough and successful. He brought to his calling a wonderful versatility of talent. He could go through a critical surgical operation with a coolness and a firmness which might seem like insensibility personified, and yet, as combined with it, there was a carefulness, a tenderness unsurpassed in a mother's love.

This was attributable to the benevolence of his heart—his crowning excellence of character. His memory is cherished as developing this benevolence in the varied relations which he sustained. His was the Christian's faith, though he made no public profession of it. The evidence of its genuineness was best furnished by his life. If his love to the cause of Christ is to be decided by his devotion to His interests, it may not be questioned. The Church in Preston City has seen dark days since his residence there. Within the last quarter of a century, those who most loved her could not but seriously fear that she was destined to become extinct. Nearly all the children of the preceding genera-

tion had flown away. A congregation of some thirty was all that could ordinarily be expected, and an undue proportion of them were the aged. If the Church lived, the house of worship must be remodeled, and a new policy adopted by the society. Dr. Downing was then one of a very few (nearly all of whom have gone to their reward), who did all they could in laying the foundations for the prosperity which has since been known and read of all men. In one point of view his example was worthy the imitation of his brethren. His professional business was always arranged, as far as practicable, so that he might punctually be in his place at the sanctuary on the Sabbath. He was leader of the choir. The love of sacred music was his master passion, and he was one of the most highly favored of men, both in ear and voice, for its successful culture. For many years he and his family did much in sustaining this part of the public worship. It was to all intents quartette singing, and it was not surpassed by any choir in the region. After all, the Author of our being designs that home should be our best emblem of heaven. The original fountain, rather than any of the streams which flow from it, is most refreshing. True, family scenes have a sacredness within a veil, which very rarely may be drawn aside. In this case the writer would not venture, had he not been an inmate there, and retained some of the holiest associations of his life. He has there seen and felt "the kind designs to serve and please" which could not but be identified with goodness.

He has there heard songs of praise,

"In notes as sweet as angels use,"

called forth by most severe affliction sanctified, which have left the impression that there needed only to have been a change of place, and it would have been the worship of those who had passed home out of great tribulation, and had washed their robes and made them white in the blood of the Lamb. It is for the benefit of the living that the worthy citizen, "the sweet singer," the "beloved physician," is in lasting remembrance, and it is thrice blessed to know that he who has "served his own generation by the will of God," has his record on high, and needs none on earth.

MEMOIR OF

ASA H. KING, M.D.

BY A. H. HOUGH, M. D., OF ESSEX.

Asa Howe King was born in New Haven, Ct., April 5, 1798. He was the son of the Rev. Asa and Eunice Howe King. He received the advantages of a thorough collegiate education, and graduated honorably at Yale College in 1821. He chose for his profession that of medicine, and took his medical degree from Bowdoin in 1824. He pursued his medical studies under the tuition of Dr. Warner of Haddam. In the fall of 1824 he commenced his professional career in the town of Branford, Ct.; from thence he removed to Essex, then a part of Saybrook. Here he continued his practice until April, 1845, when he removed to Old Saybrook, where he finished his earthly toils, Nov. 29th, 1870. He married Miss Emily Starkey of Essex, April 25th, 1841. They had four children, three sons and one daughter. Two sons and his widow survive him.

Among the commendable elements of his professional character was a deep, habitual sense of responsibility. This was so keen and ever present, as to constitute a burden which sometimes led him to regret his choice of the medical profession. It operated to restrain him from daring heroism in the treatment of his patients, and sleepless vigilence over the minutest circumstance likely to interfere with their highest interests. It was seldom he could be persuaded to suspend his professional obligations even for a healthful vacation. Another prominent characteristic was a sound judgment. On this faculty he rested with great confidence. He seldom had occasion to reverse its deliberate decisions. He risked nothing by hasty or premature conclusions, nor could he endure long the expectant plan of treatment. Rational, tried and efficient measures only satisfied his eager desire to relieve his sense of responsibility and secure the recovery of his patients.

Another feature quite prominent was a high regard for an honorable and deserved reputation. This he guarded with scru-

palous care, not only as a physician, but as a moralist of strictest type. His most intimate associates will bear testimony that he was totally exempt from indiscretion of language at all times.

Again, he possessed great uniformity of temperament, physical and mental. Few are enabled to exercise such uniformity of emotion which he was able to maintain under circumstances the most exciting. He was ever cool and self possessed, when others were roused to hasty and injudicious action. The death of his only daughter, being confined with her first child under his own roof, seemed too severe for his affectionate heart to endure. Around her bed was cultivated the deepest expressions of parental tenderness, silently expressed, of which the human heart is capable. As a physician, he was prudent, consistent, safe and successful. As a citizen, without reproach. As a husband, true and affectionate to the last. As a parent, loved and respected by his children. He made a public profession of his faith in Christ by uniting with the Congregational Church of Saybrook, May 4, 1849. Constitutionally distrustful, the latter period of his life developed clearer views of the scheme of salvation, of his depravity and helplessness, and a more trustful reception by faith of the Lord Jesus.

His death was the result of a moderate cerebral effusion, impairing the perfection and integrity of his mental faculties and voluntary muscles as well. Successive attacks at length deprived him of locomotion.

PROCEEDINGS.

The Seventy-sixth Convention of the Connecticut Medical Society, was held at New Haven, May 27th and 28th, 1848.

The Convention assembled at the Common Council Chamber, at 11 A. M., and was called to order by the Secretary. The President and Vice President being absent, J. G. Beckwith, M. D., was appointed Chairman.

The list of Fellows, as reported by the Clerks of the several County Meetings, was read by the Secretary.

The Chairman appointed Drs. H. W. E. Matthews, Wm. Wood, I. G. Porter, G. L. Beers, C. H. Hubbard, C. F. Sumner, L. Williams and Wm. Woodruff a Committee on Credentials.

The Committee on Credentials reported, and the following were declared duly elected Fellows of the Convention, viz:

NEW HAVEN COUNTY.

H. W. E. Matthews,	M. D.	Alfred North,	M. D.
Stephen G. Hubbard,	"	J. Martin Aimes,	"
J. H. Beecher,	"		

HARTFORD COUNTY.

Lucian S. Wilcox,	M. D.	F. A. Hart,	M. D.
William Wood,	"	R. H. Tiffany,	"
George Clary,	"		

NEW LONDON COUNTY.

Isaac G. Porter,	M. D.	Ashbel Woodward,	M. D.
†*Geo. E. Palmer,	"	†O. E. Miner,	"
F. S. Abbott,	"		

FAIRFIELD COUNTY.

George L. Beers,	M. D.	†M. B. Pardee,	
George F. Lewis,	"	Ira Gregory,	"
George Blackman,	"		

* Deceased. † Absent.

LITCHFIELD COUNTY.

Jeremiah W. Phelps,	M. D.	Francis J. Young,	M. D.
Josiah G. Beckwith,	"	Wm. Woodruff,	"
D. E. Bostwick,	"		

MIDDLESEX COUNTY.

Charles H. Hubbard,	M. D.	Elisha B. Nye,	M. D.
Rufus W. Matthewson,	"		

TOLLAND COUNTY.

Charles F. Sumner,	M. D.	Gilbert H. Preston,	M. D.
Stephen G. Ridley,	"		

WINDHAM COUNTY.

William A. Lewis,	M. D.	Samuel Hutchins,	M. D.
Lewis Williams,	"	Lowel Holbrook,	"
Elphalet Huntington,	"		

Drs. L. Williams and H. W. E. Matthews were appointed a Committee to wait on strangers and Delegates from other Societies and introduce them to the Convention.

The Committee of Arrangements reported the order of literary exercises, which was approved by the Convention.

The President of the Society, Dr. Charles Woodward, arrived and took the chair. The election of Officers being in order, Dr. Woodward stated that he should decline re-election.

Officers were then elected for the ensuing year, viz:

S. B. BERESFORD, M. D., PRESIDENT.
HENRY BRONSON, M. D., VICE PRESIDENT.
JAMES C. JACKSON, M. D., TREASURER.
MOSES C. WHITE, M. D., SECRETARY.

The order of business was suspended to receive the

REPORT OF THE COMMITTEE ON PRIZE ESSAYS,

which was presented by Dr. S. H. Catlin.

The Committee had awarded the Jewett Prize of Two Hundred Dollars for the best essay, on the question, "By what hygienic means may the health of armies be best preserved," to the essay

† Absent.

bearing the motto, "Hæc autem cognosci experimentis." Upon opening the envelop bearing the same inscription, the author of the essay was found to be Prof. Roberts Bartholow, M. D., of Cincinnati, Ohio.

The Committee had awarded the Russell Prize of Two Hundred dollars for the best essay on "The Therapeutic uses and abuses of Quinine and its Salts," to the essay bearing the motto "Quod Scripsi Vidi." On opening the envelop bearing the same inscription, the name of the writer was found to be Prof. Roberts Bartholow, M. D., of Cincinnati, Ohio.

The decision of the Committee on both prizes was by independent expressions of opinion, given by ballot, and was unanimous in both cases.

For the full report of the Committee, see Appendix A.

The Report of the Committee was accepted.

Dr. Catlin then introduced Prof. Bartholow to the Convention. Prof. Bartholow stated that he had served eight years in the U. S. Army, and that his personal experience in the use of Quinine and careful study of the science of army hygiene had formed the basis of the essays which had unexpectedly secured both the prizes offered by the Connecticut Medical Society.

Wm. McCollom, M. D., a delegate from the Medical Society of Vermont, E. S. F. Arnold, M. D., of Yonkers, N. Y., and Prof. J. C. Hutchinson, M. D., of Brooklyn, N. Y., delegates from the New York Medical Society, were introduced to the Convention.

Prof. J. McNaughton of Albany, an Honorary Member of the Conn. Med. Society, was also introduced. All the above named gentlemen made appropriate remarks on taking seats in the Convention.

A letter was read from the Delegates from the New Jersey Medical Society, stating that as their own society meets on the same day as the Conn. Med. Society, they would not be able to visit us this year.

On motion it was

Voted: That a Committee of one from each county be selected by the fellows of the several counties respectively to nominate persons to fill vacancies in the Standing Committees.

The Convention took a recess of a few minutes, and when order was restored, the several delegations reported as follows, and the names were read by the Secretary.

New Haven,	Stephen G. Hubbard.
Hartford,	F. A. Hart.
New London,	A. Woodward.
Fairfield,	Geo. Blackman.
Litchfield,	D. E. Bostwick.
Middlesex,	R. W. Matheweon,
Tolland,	C. F. Sumner.
Windham,	Lewis Williams.

An invitation was received from His Honor, L. W. Sperry, the Mayor, to take an excursion about the city at some convenient hour.

On motion, the invitation was accepted and referred to the Committee of Arrangements to fix the hour when it would be most convenient to take the proposed excursion.

The Chairman appointed the following gentlemen as the Committee on County Resolves, viz: Drs. Alfred North, Isaac G. Porter, Wm. Woodruff, G. H. Preston, L. S. Wilcox, Geo. Blackman, C. H. Hubbard, Lewis Williams.

On motion of Dr. Hubbard, the Chairman appointed Drs. Isaac G. Porter, J. G. Beckwith and George Blackman, a Committee on Medical Education.

The Committee of Arrangements announced that they had fixed upon 5 P. M., for the excursion.

On motion the Convention adjourned to meet again at 2½ P. M.

Afternoon Session.

At 2½ P. M., the Convention was called to order by the Vice-President, H. Bronson, M. D. The roll was called by the Secretary.

The Committee to nominate Standing Committees, made their report, and the following gentlemen were elected to fill vacancies, viz:

On Committee of Examination—D. H. Hubbard, L. Williams, Ira Gregory, H. W. E. Matthews, C. F. Sumner.

On Committee to Nominate Professors in the Medical Institution of Yale College—Henry Pierpont, Henry F. Stearns.

On Committee to Nominate Physician to the Retreat for the Insane—J. C. Jackson, Isaac G. Porter.

On Committee of Publication—G. W. Russell, L. J. Sanford.

The Chair appointed Dr. S. G. Hubbard to fill the vacancy on the Committee on *Registration*.

Dr. Willoughby of Worcester, Mass., was introduced and addressed the Convention.

The Chair appointed as a *Committee to nominate Delegates to other Societies*, Drs. I. G. Porter and J. G. Beckwith.

On Gratuitous Students—Drs. J. H. Beecher and S. Hutchins.

On Honorary Degrees and Honorary Membership—Drs. Ashbel Woodward and George Blackman.

To Nominate Dissertator and Alternate.—Dr. Isaac G. Porter.

Dr. S. G. Hubbard presented the report of the Faculty of the Medical Institution of Yale College, on the Chicago Circular in regard to a new system of Medical education. The Circular and the Reply of the Faculty, were referred to the Committee on Medical Education which was appointed at the morning session.

Dr. Hubbard also presented the action of the Faculty in regard to increased facilities for anatomical dissections. The papers were referred to the Committee on Medical Education, with power to act.

Dr. B. H. Catlin presented the Report of the Committee on Registration, which was accepted and ordered on file.

Dr. Isaac G. Porter the Committee on Dissertator, made his report, which was accepted and adopted, viz., Dissertator, C. M. Carleton; Alternate, L. S. Wilcox.

At 4 P. M., Dr. S. G. Hubbard read a paper entitled "Ante-mortem and Post-Mortem Observations upon the case of the late President Day," accompanied by photographs, of remarkable calculi connected with the case.

The Secretary stated that the Committee of Publication intended to have the photographs accompanying this paper engraved and published with the Proceedings, as the case was believed to be without a complete parallel in the records of surgery.

A communication was received from the Board of Education, inviting the members of Convention to visit the Public Schools of the City at their convenience.

Voted: That the Convention accept the invitation to visit the Public Schools as the Members may find convenient on Thursday.

The Committee to nominate Delegates to other societies, made their report, which was adopted as follows, viz:

To the American Medical Association, G. W. Russell, M. D., of Hartford, A. North, M.D., of Waterbury, R. A. Manwaring, M.D., of New London, C. M. Carleton, M. D., of Norwich, Lewis Williams, M. D., of Pomfret.

To the Maine Medical Association, G. H. Preston, M. D., of Tolland, Wm. Woodruff, M.D., of Plymouth Hollow.

To the Vermont Medical Society, S. L. Childs, M. D., of East Hartford, Wm. Wood, M. D., of East Windsor Hill.

To the New Hampshire Medical Society, H. M. Knight, M. D., of Lakeville, Chas. F. Sumner, M. D., of Bolton.

To the Massachusetts Medical Society, A. W. Nelson, M. D., of Mystic, E. K. Hunt, M. D., of Hartford.

To the New York State Medical Society, Henry Bronson, M. D., of New Haven, G. L. Platt, M. D., of Waterbury, Melancthon Storrs, M. D., of Hartford, J. G. Beckwith, M. D., of Litchfield, C. A. Lindsley, M. D., of New Haven.

To the New Jersey Medical Society, B. H. Catlin, M. D., of West Meriden, Alvan Talcott, M. D., of Guilford.

Voted: That Delegates to the American Medical Association and to other Societies, have power to appoint substitutes, who may apply to the Secretary for credentials.

Voted: That the *Annual Tax* be *Two Dollars*, payable June 1st, 1868.

Voted: That 600 copies of the Proceedings be published.

The President appointed Dr. A. Woodward on the Committee on Gratuitous Students, in place of Dr. J. H. Beecher, who was absent.

The Committee on County Resolves, made their report, recommending that the action of the New Haven County Meeting expelling Henry W. Painter, M. D., for the practice of Homeopathy and for consulting with Homeopaths, be confirmed.

This recommendation was approved, and the action of New Haven County Meeting was confirmed.

The same Committee recommended that the papers presented by the Fairfield County Meeting be referred back to the Fairfield County Meeting.

This recommendation was also adopted.

Voted: That the session to-morrow commence at 9 A. M.

Adjourned to 8 P. M.

Evening Session.

The Convention re-assembled at 8 P. M., the Vice President, H. Bronson, M. D., in the Chair.

The retiring President, Charles Woodward, M. D., delivered the

Annual Address on "Our Organization—Its Relations and Responsibilities."

The thanks of the Convention were voted to Dr. Woodward, the retiring President, for the able manner in which he has presided over the Convention, and for the able and interesting address delivered this evening.

H. A. Carrington, M. D., then read the Annual Dissertation on "The Relation of Theory to Practice."

A vote of thanks was tendered to Dr. Carrington, and a copy of the Dissertation was requested for publication.

On motion of Dr. S. G. Hubbard it was

Resolved: That so much of the President's Address as relates to Medical Education, be referred to the Committee on Medical Education, and so much as relates to the Organization of the Society, be referred to the Committee appointed two years ago, who desire to present a report to this Convention.

Dr. C. A. Lindley presented a report of his visit of last summer as a Delegate to the Medical Society of New Jersey.

On motion the report was referred to the Committee of Publication.

Adjourned to 9 A. M.

Thursday Morning, May 28th.

At 9 A. M., the Convention was called to order by the Vice President, Henry Beeson, M. D.

The Committee on Honorary Degrees and Honorary Membership, made their report, and on the recommendation of said Committee, S. F. L. Simpson, M. D., of Concord, N. H., and A. T. Woodward, M. D., of Brandon, Vt., who were nominated last year, were elected to Honorary Membership. On similar recommendation the names of Wm. McCollom, M. D., of Vermont, John C. Hutchinson, M. D., of Brooklyn, N. Y., Benj. E. Cotting, M. D., of Boston, Mass., were placed on the list of Candidates for Honorary Membership.

On recommendation of the Committee it was

Resolved: That John Gray of Groton, who has been twenty-five years in the practice of medicine, be recommended to the Corporation of Yale College, as a suitable person to receive the Honorary Degree of Doctor of Medicine.

The Report of the Committee was accepted, and all the recommendations of the Committee were adopted by the Convention.

Dr. Bronson resigned the chair to the President, Dr. S. B. Bercford, who had just arrived.

Dr. Isaac G. Porter presented a Report of the Committee on Medical Education, approving the reply of the Faculty of the Medical Institution of Yale College, to the Chicago Circular on Medical Education. (See Appendix D.)

Voted: That the thanks of the Convention be tendered to the Mayor, for the use of the Council Chamber for the meetings of this Convention, and for other attentions furnished by His Honor for the pleasure of the Convention.

Voted: That the Committee to nominate Professors in Yale College, present to the Committee of Publication, a report of their doings the past year to be inserted in the Proceedings.

Voted: That the Committee of Examinations be allowed to present their report, without reading, to the Committee of Publication for insertion in the Proceedings.

The Jewett Prize Essay on *Army Hygiene* was read in part by the author, Prof. R. Bartholow, of Cincinnati, Ohio.

Dr. Henry Pierpont then exhibited a remarkable case of *Scoliosis Spinosus* in the person of a girl about 10 years of age. On motion of Dr. H. W. E. Matthews, it was

Resolved: That Dr. Pierpont be requested to prepare a description of the case and procure a photograph of the same for publication in the Proceedings.

Dr. J. G. Beckwith from the Committee on Organization, presented a report, which after discussion was accepted and referred to a new Committee, consisting of Drs. H. M. Knight, C. A. Lindsley, C. L. Ives, L. S. Wilcox and I. G. Porter, with instructions to put the subject in proper form for final action by the next Convention.

Dr. M. Gonzales Echeverria, by invitation, read a paper on "*The Treatment of Paralysis by Hypodermic Injection of Strychnine, and on Infantile Palsy.*"

The thanks of the Convention were voted to Dr. Echeverria for his interesting paper, and a copy was requested for publication.

Prof. R. Bartholow then read a part of the Russell Prize Essay on the "*Therapeutical Uses and Abuses of Quinine and its Salts.*" The subject was discussed by Drs. B. H. Catlin, Isaac G. Porter and W. L. Bradley.

By invitation of the Convention, Dr. Baird of New York, then read a paper on "*The Use of Electricity in the Treatment of Nervous Diseases.*"

On motion of Dr. H. W. E. Mathews, 100 additional copies of the Proceedings were ordered to be published, making the number of copies to be published 700 instead of 600 hundred as previously ordered.

The Secretary then read the list of members of the Society who had died during the past year, with brief statements of their ages, causes of death, &c., and called on Dr. E. B. Nye, who read a memoir of the late Datus Williams, M. D., of East Haddam.

A paper detailing an interesting case of *Traumatic Lesion of the Knee Joint*, read before the New London Co. meeting by E. F. Coates, and presented for publication, was read by the Chairman of the Publishing Committee.

Voted: That the next Convention be held in Hartford, commencing at 11 A. M., on the *Fourth Wednesday* in May, 1869.

On motion it was

Resolved: That the Clerks of the several County meetings be required to send a Report of their County Meetings to the Secretary of the Conn. Med. Society, *before the first of May* in each year.

It was also

Voted: That the Secretary be directed to publish a programme of the Arrangements for the Convention and send a copy of the same to every member of the Society, with a special invitation to be present at the Convention.

At 2½ P. M., the Committee of Arrangements announced that the regular business of the Convention was concluded. The President called for miscellaneous business, but no further business was presented.

Dr. C. A. Lindsley gave notice that at 3 P. M., the Members of the Convention and others, would be invited to form in procession with the New Haven Medical Association and proceed to the New Haven House, where a Dinner had been provided by the City Association.

On motion, the Convention adjourned.

An interval of half an hour was spent in friendly greetings, after which the members of the Convention, Delegates from other Societies, the City Association and other guests, accompanied by ex-Governor Buckingham and Mayor Sperry, repaired to the New Haven House. When assembled at the table,

Dr. H. Bronson made the following *Address of Welcome.*

GENTLEMEN, *The President and Fellows of the Connecticut Medical Society:* In the name of the N. H. Medical Association, I extend to you on this occasion, a cordial welcome. It is not often we are permitted to meet you face to face in this way, to enjoy a little social intercourse, to reciprocate good feeling, to strengthen old friendships, and to pledge ourselves anew to one another, and to the profession we love. It is well occasionally,—wise and well—to lay aside our graver duties—

to put off the professional harness, and have an hour's recreation—an hour in which we are at liberty to repeat some of the follies of other men—to get dyspeptic if we choose, to invite the night-mare and to receive a headache. We have lost many of our rights by becoming physicians—not even the right to exchange places with our patients, and to swallow, of Morton, the nauseous drugs we love to give but rarely take. The outside world have their festive occasions, times of frenzy, when they throw up their hats, and talk frenzily and foolishly. Then why should not we, now and then, pause in the work of counting pulses, giving bitter drafts, stroking our beaming chins, and torturing our best friends: why should not we, for a time, suspend our curricular utterances, and smoothing our wrinkled and thought-laden brows, have a little innocent pastime? Why may not we, for the moment, look and act like other men? He who says our patients will get well in our absence is a scoffer, and should have his tongue pulled out. Of course, our conduct must be such as befits our station. We must be more decorous than the outside barbarians, between whom and us there is an eternal wall of separation. Our very great dignity and the profound respect we entertain for ourselves will not allow of rollicking, unseemly demonstrations. Whatever we condescend to do must be done *secundum ordem*, that is, in a scientific and artistic manner. (I add this explanation for the benefit of our friends here over the wall.)

For strengthening the cords of friendship, and opening the sluices of human sympathy, there is nothing so effectual as a social gathering of this kind. If men would love one another, in the Scripture sense, they must dine together. Let those having kindred instincts, sit down in double file, *vis a vis*, at the same table, dissecting in eager, pleasant strife with the same implements, hitting elbows in friendly recognition, bursting buttons, hearing side-splitting well worn jokes at the passes, the coldest gradually warming up, the most stolid getting humorous or humid as the case may be, and at last closing up with a grand pyrotechnic exhibition, with brilliant corruscations of wit and oratory; let men do this, and they are ever after sworn friends. Their hearts are joined as with hooks of steel. Suspicion, jealousy and selfishness grow out of isolation. Social intercourse wears off the angular points of character, and calls forth the better qualities of our nature—humanizes, harmonizes, liberalizes.

Not doubting, gentlemen, that our efforts to promote good fellowship will bear abundant fruit, we invite you without further preface, to the scientific and instrumental part of this performance.

After full attention had been paid to the dinner, toasts were given as follows:

"The Medical Profession, fostered by the State, may it ever remain under her protecting care." This was appropriately responded to by Ex-Governor Buckingham.

"Public health and public prosperity, one and inseparable, may the civil officers ever unite with the Medical Profession in the furtherance of this Union."

This was replied to by Mayor Sperry and Alderman DeForest.

"The Medical Profession of the olden time, may we act up to our light as faithfully as they did to theirs." Dr. Porter of New London made the response to this.

"Our Sister Societies, kindred tastes, kindred pursuits, and kindred sympathies are the natural bonds of our unity." Responses were made by Drs. McNaughton, Hutchinson, Bartholow, Arnold, Rioux and McCollom.

"Our County Societies, active children of a healthy parent, may they emulate each other for the advancement of Medical Science."

Drs. S. Wilcox, of Hartford, and S. G. Hubbard, of New Haven, replied.

Thus closed one of the most interesting Conventions ever held by the Conn. Medical Society.

Attest,

M. C. WHITE, *Secretary.*

OFFICERS OF THE SOCIETY,

FOR 1868--9.

PRESIDENT,
S. B. BEARDSLEY, M. D., OF HARTFORD.

VICE-PRESIDENT,
HENRY BRONSON, M. D., OF NEW HAVEN.

TREASURER,
JAMES C. JACKSON, M. D., OF HARTFORD.

SECRETARY,
MOSES C. WHITE, M. D., OF NEW HAVEN.

STANDING COMMITTEES.

Committee of Examination.

S. B. BEARDSLEY, M. D., *Ex-officio.*
H. M. KNIGHT, M. D.
P. M. HASTINGS, M. D.
D. H. HUBBARD, M. D.
LEWIS WILLIAMS, M. D.
IRA GREGORY, M. D.
H. W. F. MATTHEWS, M. D.
C. F. SUMNER, M. D.

Committee to Nominate Professors in the Medical Institution of Yale College.

J. B. WHITCOMB, M. D.
J. B. LEWIS, M. D.
L. S. PADDOCK, M. D.
HENRY PIERPONT, M. D.
H. P. STEARNS, M. D.

Committee to Nominate Physician to the Retreat for the Insane.

G. H. PRESTON, M. D.
WM. WOODRUFF, M. D.
ELISHA B. NYE, M. D.
JAMES C. JACKSON, M. D.
ISAAC G. PORTER, M. D.

Committee of Publication.

M. C. WHITE, M. D., *Ex-officio.*
HENRY BRONSON, M. D.
ALVAN TALCOTT, M. D.
G. W. RUSSELL, M. D.
L. J. SANFORD, M. D.

Committee on Registration.

L. S. WILCOX, M. D.
H. W. E. MATTHEWS, M. D.
S. G. HUBBARD, M. D.

Dissector—C. M. CARLETON, M. D.
Alternate—L. S. WILCOX, M. D.

MEMBERS OF THE SOCIETY.

HONORARY MEMBERS.

EDWARD DELAFIELD,	New York City.
JOHN DELAMATER,	Cleveland, O.
JACOB BIGELOW,	Boston, Mass.
WALTER CHANNING,	Boston, Mass.
NATHAN RYNO SMITH,	Baltimore, Md.
RICHMOND BROWNELL,	Providence, R. I.
SAMUEL HENRY DICKSON,	Philadelphia, Pa.
WILLARD PARKER,	New York City.
ALDEN MARCH,	Albany, N. Y.
CHARLES A. LEE,	New York City.
HENRY D. BULKLEY,	New York City.
J. MARION SIMS,	New York City.
FRANK H. HAMILTON,	Brooklyn, L. I.
ROBERT WATTS,	New York City.
J. V. C. SMITH,	New York City.
O. WENDELL HOLMES,	Boston, Mass.
JOSEPH SARGENT,	Worcester, Mass.
FOSTER HOOPER,	Fall River, Mass.
THOMAS C. BRINSMADE,	Troy, N. Y.
GEORGE CHANDLER,	Worcester, Mass.
GILMAN KIMBALL,	Boston, Mass.
JAMES McNAUGHTON,	Albany, N. Y.
USHER PARSONS,	Providence, R. I.
EBENEZER ALDEN,	Randolph, Mass.
B. FORDYCE BARKER,	New York City.
JOHN G. ADAMS,	New York City.
JARED LINSLEY,	New York City.
A. J. FULLER,	Bath, Me.
SAMUEL H. PENNINGTON,	Newark, N. J.
FREDERICK N. BENNETT,	Orange, N. J.
THOMAS C. FINNELL,	New York City.
N. C. HUSTED,	New York City.
JACOB F. WHITTEMORE,	Chester, N. H.
THOMAS SANBORN,	Newport, N. H.
WILLIAM PIERSON,	Orange, N. J.
ARTHUR WARD,	Belleville, N. J.

HIRAM COGLISS,	Washington, N. Y.
K. K. WEBSTER,	Rochester, N. H.
P. A. STACKPOLE,	Dover, N. H.
S. F. L. SIMPSON,	Concord, N. H.
A. T. WOODWARD,	Vt.

PROPOSED FOR HONORARY MEMBERSHIP.

WILLIAM McCULLOM, M. D.,	Vt.
J. C. HUTCHINSON, M. D.,	Brooklyn, N. Y.
BENJ. E. COTTING, M. D.,	Boston, Mass.

ORDINARY MEMBERS.

The names of those who have been Presidents are in Capitals.

NEW HAVEN COUNTY.

HENRY A. CARRINGTON, M.D. of New Haven, Chairman.

EDWARD BULKLEY, M.D., of New Haven, Clerk.

New Haven, Samuel Pendleton,* A. S. Munson,* NATHAN B. IVES, E. H. Bishop, Levi Ives, P. A. Jewett, David L. Daggett, George C. Sumner,* David A. Tyler, Henry Bronson, E. A. Park, S. G. Hubbard, H. W. E. Matthews, C. A. Lindley, T. H. Tetlow, John Nicoll, Moses C. White, H. Pierpont, J. H. Boocher, Leonard J. Sanford, Chas. L. Ives, Edward Bulkley, W. B. De Forest, F. L. Dibble, T. Beers Townsend, Geo. A. Ward, Evelyn L. Bissell, T. H. Bishop, Eli W. Blake, Henry A. DuBois, Francis Storer, C. O. Stockman, J. W. Barber, Charles A. Gallagher, Robert Stone, William D. Anderson, W. Lockwood Bradley, J. E. Winchell, O. F. Treadwell, H. Carrington, George P. Barker, L. M. Gilbert, J. W. Terry, S. D. Wilcoxson, Frank Gallagher.

Fair Haven, Chas. S. Thomson,* W. H. Thomson, Wm. M. Wilde.

Branford, H. V. C. Holcomb, Newton B. Hall.

ChesHire, A. J. Driggs.

Derby, Charles H. Pinney.

Birmingham, Ambrose Beardsley.

Ansonia, C. W. Shaffey.

Guilford, Joel Canfield,* Alvan Talcott.

Hamden, Edwin D. Swift.

Madison, D. M. Webb.

Meriden, (West), R. H. CAYLEN, Asa H. Churchill, James G. Baum, Jas. J. Averill, Frederick J. Fitch.

Milford, Hull Allen,* L. S. Beardsley, Thomas Dutton.

Naugatuck, J. D. Moore,* S. C. Bartlett, Frank G. Tuttle.

North Branford, Sheldon Beardsley.*

North Haven, E. F. Stillman.

Orange, West Haven, J. Martin Adams.

Oxford, Lewis Barnes.

Seymour, Thos. Stoddard, S. C. Johnson, Joshua Kendall.

Southbury, A. B. Burritt.*

South Britain, N. C. Baldwin.

Wallingford, Selemiah Banks.

Waterbury, G. L. Platt, John Deane, George E. Perkins, Philo G. Rockwell, Thos. Dougherty, Alfred North, Edward L. Griggs.

* Over sixty years of age.

HARTFORD COUNTY.

S. L. CHILDS, M. D., *of* East Hartford, Chairman.

IRVING W. LOVE, *of* Hartford, Clerk.

HARTFORD, Henry Holmes, S. B. EBERESTOR, G. S. Hawley, G. W. Russell, David Crary, F. W. Ellsworth, E. K. HUNT, J. S. Butler, J. C. Jackson, A. W. Barrows, Thomas Miner, William Porter, John F. Wells, William R. Brownell, P. M. Hastings, Edward Bulkley, W. H. Tremaine, Lucian S. Wilcox, Henry P. Stearns, S. C. Preston, I. W. Lyon, Daniel Pell Mclaughlin Sherry, Horace S. Fuller, John O'Flaherty, Nathan Mayer, Wm. M. Hudson, Geo. C. Jarvis, Albert J. Merrill, Morton W. Easton.

BERLIN, E. Brandegee.

BLOOMFIELD, Henry Gray.

BRANDFORD, E. R. Leonard.

CANTON, Collinsville, E. H. Tiffany.

EAST GRANBY, Chester Humlin.*

EAST HARTFORD, S. L. Childs, Edward H. Brownell.

EAST WINDSOR HILL, Sidney W. Rockwell, William Wood.

Warehouse Point, Marcus L. Fisk.

ENFIELD, Thompsonville, Edward F. Parsons.

FARMINGTON, Frank Wheeler, Charles Cunnington.

Plainville, G. A. Moody, D. L. Lounsbury.

GRANBY, North, Francis F. Allen.

GLASTENBURY, H. C. Bunce.

South Glastenbury, C. E. Hammond, G. A. Hubbard.

MANCHESTER, William Scott.

NEW BRITAIN, E. N. Cowings, S. W. Hart, Geo. Clary, C. E. Hart, E. H. Lyon.

ROCKY HILL, R. W. Griswold.

SIMSBURY, Tariffville, G. W. Sanford.

Weatogue, R. A. White.

SOUTHINGTON, Julius S. Barnes,* N. H. Tyington, F. A. Hart.

SUFFIELD, Asnah Risley,* O. W. Kellogg, A. H. Mason.

WEST GRANBY, Justus D. Wilcox.*

WEST HARTFORD, Edward Bruce.*

WETHERSFIELD, E. F. Cook,* A. S. Warner.

WINDSOR, A. Morrison, S. A. Wilson.

WINDSOR LOCKS, Samuel W. Skinner, Levi Jewett.

NEW LONDON COUNTY.

ASHBEL WOODWARD, M. D., *of* Franklin, Chairman.

ALBERT T. CHAPMAN, M. D., *of* Mystic, Clerk.

NEW LONDON, Nathaniel S. Perkins, ISAAC G. PORTER, D. P. Francis, Robert A. Manwaring, Robert McCurdy Lord, A. W. Nelson, F. W. Brandon.

NORWICH, Richard P. Tracy, Elijah Dyer, Elisha Pitkney, A. B. Halle, Lewis S. Parkhirst, Chas. M. Carleton, F. S. Abbott.

BOZRAH, Samuel Johnson.

COLCHESTER, Ezekiel W. Parsons, Frederick Morgan.

FRANKLIN, ASHBEL WOODWARD.

Greeneville, Wm. Witter.

GRISCOM, Mystic River, A. W. Coates, John Gray.

NORTH, Orrin E. Miner.

LEBANON, Ralph E. Green.

MYSTIC, Mason Manning, Albert T. Chapman.

OLD LYME, Richard Noyes.

PRESTON, Eleazer E. Browning.

STONINGTON, J. H. Fairbanks.

STONINGTON, William Hyde.

Mystic Bridge, E. Frank Coates.

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* *Over sixty years of age.*

FAIRFIELD COUNTY.

SAMUEL S. NOYES, M. D., of New Canaan, Chairman.

George L. Beers, M. D., of Bridgeport, Clerk.

Greenfield, Rufus Blakeman.*
Southport, Justus Sherwood.*
Bridgeport, William C. Nash,* David H. Nash, Robert Hubbard, H. L. W. Burritt, Elijah Gregory, Geo. L. Beers, Andrew I. Smith, Augustus H. Abernethy, George F. Lewis, James R. Cumming, Gustave Ohmeyer.
Brookfield, A. L. Williams.
Danbury, F. P. Bennett,* James Baldwin,* William C. Bennett.
Bethel, A. C. Benedict.
Darien, Samuel Reeds.
Easton, Walter R. Griswold.*
New Canaan, Samuel S. Noyes,* Lewis Richards,* William B. Brownson.
Norwalk, John A. McLean,* Ira Gregory,* Samuel Lynes, John W. McLean, James E. Barbour, W. A. Lockwood.
South Norwalk, M. B. Purdee, E. L. Higgins, W. S. Roberts.
Ridgefield, O. S. Hickok.
Stamford, N. D. Haight,* W. H. Taylorbridge.
North Stamford, Geo. W. Birch.
Stratford, Roger M. Grey, R. C. Mervin.
Trumbull, George Dyer.*
Westport, George Blackman,* William Badger George B. Boston.
Wilton, A. S. Emery.

WINDHAM COUNTY.

HARVEY CAMPBELL, M. D. of Voluntown, Chairman.

Samuel Hutchins, M. D., of West Killingly, Clerk.

Windham, Chester Hunt, E. Huntington.
Ashford, John H. Simmons.
Brooklyn, James H. Whitcomb, Wm. Woodbridge.
Canterbury, Joseph Palmer.
Chaplin, Orrin Witter.*
Hampton, Dyer Hughes.*
Killingly, Justin Hammond.*
South Killingly, Daniel A. Hovey.*
West Killingly, Samuel Hutchins, Frank A. Tillinghast.
East Killingly, Edwin A. Hill.
Plainfield, WM. H. COGSWELL.
Central Village, Charles H. Rogers.
Pomfret, Hiram Holt, Lewis Williams.
Putnam, H. W. Hough, Daniel B. Plympton.
Scotland, Calvin B. Brumley.
Plainfield, Moosup, Wm. A. Lewis.
Thompson, Lowell Holbrook, Charles Hosford.
Voluntown, Harvey Campbell.
Westford, Putnam O. Bennett.
Woodstock, Lorenzo Marcy.
East Woodstock, Asa Witter,* John Witter.
West Woodstock, Miles Bradford.
Windham, Willimantic, Fred. Rogers, T. Morton Hills, Horace E. Babcock.

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* Over sixty years of age.

LITCHFIELD COUNTY.

J. W. PHELPS, M. D., of Wolcottville, Chairman.

J. G. BECKWITH, M. D., of Litchfield, Clerk.

LITCHFIELD, Josiah G. Beckwith,* H. Hotchkiss, Myron Downs.*
W. Bull, D. E. Bostwick.
Northfield, D. B. W. Camp.
BARKHAMSTED, Riverton, Francis J. Young.
CANAAN, North, Ithamar B. Smith, Albert A. Wright.
CORNWALL, (West Cornwall) S. W. Gold, Edward Sanford, Perritt B. North.
HARWINTON, Garry H. Mines,* Wm. Deming.
NEW MILFORD, Henry S. Terrell, J. K. Bacon.
Gaylordsville, G. H. St. John, Charles P. Couch.
NORFOLK, William W. Welch, John H. Welch.
PLYMOUTH, Samuel T. Salisbury.
Thomastown, William Woodruff.
SALISBURY, Lakeville, Benj. Welch,* Wm. Hazell, H. M. Knight.
SHARON, Ralph Dunlap,* William W. Knight.
TORRINGTON, Erastus Bancroft.*
Wolcottville, Jeremiah W. Phelps, T. S. Hamblett, A. E. Barber.
WARREN, John R. Dickinson.
WASHINGTON, Horace M. Fowler.*
New Preston, Sidney H. Lyman, Edward H. Lyman.
WATERTOWN, W. S. Munger.
WINCHESTER, West Winsted, James Welch,* John W. Bidwell.
WOODBURY, Charles H. Welch, Harmon W. Shove.

MIDDLESEX COUNTY.

IRA HUTCHINSON, M. D., of Cromwell, Chairman.

MOSES C. HAZEN, M. D., of Haddam, Clerk.

MIDDLETOWN, CHAS. WOODWARD, Elisha S. Nye, George W. Burke, William S. Casey, John Ellis Blake, Rufus Baker, F. G. Edgerton.
CHATHAM, Middle Haddam, Albert F. Worthington.
CHESTER, Sylvester W. Turner.
CLINTON, Denison H. Hubbard.
CROMWELL, Ira Hutchinson.
DURHAM, R. W. Matherson.
ESSEX, Alanson H. Hough, Charles H. Hubbard.
HADDAM, Miner C. Hazen.
KILLINGWORTH, G. B. Reynolds.
OLD SAYBROOK, Asa H. King.
PORTLAND, George O. Jarvis, C. A. Sears.
SAYBROOK, Deep River, Edwin Bidwell.

TOLLAND COUNTY.

CHARLES F. SUMNER, M. D., of Bolton, Chairman.

GILBERT H. PRESCOTT, M. D., of Tolland, Clerk.

TOLLAND, Oliver K. Isham,* G. H. Preston.
BOLTON, Chas. F. Sumner.
COLUMBIA, Moses H. Perkins.
COVENTRY, John B. Porter,* Maurice R. Bennett.
South Coventry, Timothy Dimock,* Henry S. Dean.
ELLINGTON, J. A. Warren.
MANSFIELD, Wm. H. Richardson.
Mansfield Center, Earl Swift,* O. B. Griggs.
Mansfield Depot, Norman Bingham.*
SOMERS, Orson Wood.*
STAFFORD, Wm. N. Clark.
West Stafford, Joshua Hodgett.*
Stafford Springs, C. B. Newton.
Vernon Depot, J. H. Goodrich.
Rockville, Stephen G. Risley, Francis L. Dickinson, J. B. Lewis.

* Over sixty years of age.

SUMMARY OF MEMBERS, APRIL 1, 1868.

	Total.	Deaths.
New Haven County,	95	1
Hartford County,	72	1
New London County,	39	2
Fairfield County,	45	5
Windham County,	32	0
Litchfield County,	39	0
Middlesex County,	20	1
Tolland County,	21	0
	363	10

NOTE.—Former Fellows of the Connecticut Medical Society are permanent members of the Annual Convention, and take part in all the proceedings of the Convention, except the election of Officers and Standing Committees. All the members of the Society are especially requested to be present at the next Convention.

DEATHS OF MEMBERS DURING THE YEAR ENDING MAY 1, 1868.

New Haven County.

Prof. Worthington Hooker, M. D., of New Haven, died November 6th, 1867, of typhoid fever, aged 62 years.

Hartford County.

Roswell Hawley, M. D., of Bristol, died December, 1867, of consumption, aged 65 years.

New London County.

Erastus Osgood, M. D., of Norwich, died December 23d, 1867, of old age, aged 87 years.

George E. Palmer, M. D., of Stonington, died —— —, 1868.

Fairfield County.

Hanford N. Bennett, M. D., of Bridgeport, died April 21st, 1868, of Meningitis, aged 49 years, 11 months.

S. P. V. R. Ten Broeck, M. D., of Fairfield, died April 21st, 1868.

Frank N. H. Young, of Danbury, died of Bright's Disease.

William T. Shelton, M. D., of Stratford, died March 6th, 1868, of old age, aged 77 years and 7 days.

James H. Shelton, M. D., of Huntington, died May 16th, 1868, of Dropsy, aged 63 years.

Middlesex County.

Datus Williams, M. D., of East Haddam, died Nov. 4, 1867, aged 74 years 8 months and 9 days.

DUTIES OF COUNTY CLERKS.

To warn County Meetings.

To record the proceedings of the County Meetings.

To collect the taxes and pay the same to the Treasurer.

To return to the Treasurer the names of Members delinquent on taxes, with the amounts severally due from each.

To transmit to the Secretary a list of the elected Fellows, and the person recommended as a candidate for a gratuitous course of lectures in the Medical Institution of Yale College, and the titles of essays recommended for publication, with the names of their authors, by the first of May in each year.

To transmit duplicate lists of the Members of the Society to the Secretary and Treasurer, on or before the first day of the Convention, on penalty of five dollars for each neglect.

To report to the Secretary of the State Society, on the first day of its Annual Convention, the names, ages, and diseases of the Members of this Society who have died during the year preceding the 1st of April in each year, in their several County Societies.

RULES OF ORDER.

1. Organization.
2. Certificates of Membership presented and read by the Secretary.
3. Committee on the Election of Fellows.
4. Address of President.
5. Election of officers for ensuing year.
6. Unfinished business of previous year disposed of.
7. Reception and reference, without debate, of Communications, Resolves, &c. from the several Counties, and Members of the Convention.
8. Reading Treasurer's Report.
9. Committee to audit the same.
10. Standing Committees appointed.
11. Committee to nominate Delegates to American Medical Association.
12. Committee on Candidates for Gratuitous Course of Lectures.
13. Committee on Honorary Degrees and Honorary Membership.
14. Committee to nominate Dissertator.
15. Dissertation.
16. Reports of Committees appointed on County Communications, Resolves, &c.
17. Reports of Standing Committees.
18. Reports of Committees in the order in which business was brought forward in Convention.
19. Miscellaneous business.

APPENDIX A.

Report of the Committee on Prize Essays.

The Committee on Prize Essays, respectfully report,—

That the authors of the essays presented to the Committee last year in competition for the Jewett Prize on the question, "By what Hygienic means may the health of armies be best preserved," in accordance with an offer extended to them, recalled their papers for alteration or improvement. Three of them were returned and one new one received.

The Committee have carefully read and closely examined all these papers, and after consultation and mature deliberation have unanimously awarded the Jewett Prize to the Essay bearing the motto "Haec autem cognosi experimentis."

Upon opening the envelop bearing the same device, the name of the author was ascertained to be Roberts Bartholow, A. M., M. D., of Cincinnati, Ohio.

For the Russell Prize upon "The Therapeutic Uses and Abuses of Quinine and its Salts," seven valuable essays have been received.

The Committee have most faithfully read, examined and compared these papers, and after consultation and deliberation, have by an independent expression of opinion by ballot, (as on the former question), unanimously awarded the Russell Price to the essay bearing the motto "Quod scripsi vidi."

On examination of the envelop superscribed with the same device, the author was found to be Roberts Bartholow, A. M., M. D., Prof. of Materia Medica and Therapeutics, in the Medical College of Ohio.

In awarding these prizes, the Committee do not hold themselves responsible for every opinion or sentiment they contain. For instance, the author's opinion on the use of Quinine in continued fevers is contrary to the experience of some, if not all the members of the Committee. In regard to the unsuccessful essays, the Committee

would remark that most of them are valuable papers containing the results of much practical experience and extensive research. If they could be published in the Medical Journals they would, it is believed, be well received, and the Committee would take pleasure in referring to them. One of those competing for the Jewett prize was very voluminous, involving great labor in its preparation, but it is better calculated for a volume than a prize essay. One upon Quinine should be more particularly mentioned. Its mechanical execution was very perfect—besides, it contained a large amount of the author's personal experience, and the therapeutic history of Quinine up to the present time. It should be given to the public in some form.

B. H. CATLIN.
LEONARD J. SANFORD.
HENRY BRONSON.
MELANCTHON STORRS.
CHARLES L. IVES.

New Haven, May 27, 1858.

The unsuccessful essays are in the hands of the gentlemen to whom they were forwarded, subject to the order of their authors.

APPENDIX B.

Report of the Committee of Examination.

Your Committee beg leave to report that at the examination, at the close of the summer session of the Medical Institution of Yale College, held July 16th, 1867, there were present on the part of the Society, Chas. Woodward, M. D., President ex-officio, Ira Hutchinson, M. D., H. N. Bennett, M. D., Chas. L. Ives, M. D., and on the part of the College, Profs. Hooker, Hubbard, Lindsley and Sanford, with Drs. T. B. Townsend and G. F. Barker.

The following gentlemen were examined and recommended for the Degree of M. D.:—

George E. Cragin, Wallingford. Thesis, Oxalic Acid in Rhubarb.

Theodore R. Noyes, Wallingford. Thesis, Experimental researches on the Elimination of Urea.

Julian Newell Parker, Mansfield. Thesis, Sleep.

Alfred Eastman Walker, B.A., New Haven. Thesis, Inflammation.

William Verdi. Wilson, New Haven. Thesis, Wounds in general.

The Theses of the first two gentlemen were based upon very elaborate original research—and the results obtained were deemed so important that the Board voted that the thesis of Mr. Noyes be sent for publication to the American Journal of Medical Science, and that the thesis of Mr. Cragin be recommended for publication in the Transactions of the Conn. Med. Society.

The Examination at the close of the winter session, was held January 9th, 1868. Present, of your Committee, Drs. Chas. Woodward, Hutchinson, Knight, Ives and Hastings; on the part of Yale College, Profs. Hubbard, Lindsley, White, Sanford, Barker and Dr. T. B. Townsend.

The following gentlemen were duly examined and recommended for the Degree of M. D.:

Robert Bradley Goodyear, North Haven. Thesis, Typhoid Fever.

Thomas Hatcher, B. A., New Haven. Thesis, On the Microscopic structure of the Kidney and its Function.

Henry Martin Reeve, Norwich. Thesis, Acute Peritonitis.

James Langford Weaver, Nonk. Thesis, The Physician.

The prize of a pocket case of Instruments offered by the late Prof. Hooker to the candidate passing the best examination, and placed by his widow in the hands of your Committee, was awarded to Mr. H. M. Rising.

E. K. Hunt, M. D., of Hartford, was appointed to deliver the Annual Address before the Candidates for degrees in 1869, with H. A. Carrington, M. D., of New Haven, as alternate.

In the evening, the Commencement exercises were held in the lecture room of the College,—embracing the Valedictory Address by Mr. J. L. Weaver, the Prize Presentation and the conferring of Degrees by the President. Through the failure of the appointee, Dr. R. Hubbard, of Bridgeport, there was no Annual Address.

In conclusion, your Committee take pleasure in testifying to the general proficiency in the examinations in the various departments, and especially to the great improvement in Chemistry, in which medical students so generally fail. It is a gratifying fact that two of the candidates had returned to this Institution from a lecture course in one of our larger cities, because they could nowhere find facilities for chemical study equal to those enjoyed here.

Your Committee would also record the satisfaction with which they recognize the endeavor of the Faculty of the College to remedy the acknowledged imperfections of a mere lecture course, by the thorough and regular recitations of the Summer Session. And they would recommend such instruction to those preparing to enter the profession, as tending to develop that mental discipline, without which, unfortunately, so many undertake the study of medicine.

Respectfully submitted on behalf of the Committee,

CHAS. L. IVES, *Secretary.*

APPENDIX C.

Report of Nominating Committee.

The Committee appointed to Nominate Professors in the Medical Institution of Yale College, would respectfully Report—

That a meeting of the Joint Committee of the Corporation of Yale College and the Connecticut Medical Society was held in New Haven, agreeably to the call of the President of Yale College, at his house, July 13th, 1867.

There were present, on the part of the Corporation of Yale College, Rev. Theodore D. Woolsey, D. D., LL. D., Rev. Joseph Eldridge, D. D., Rev. Joel H. Linsley, D. D., and on the part of the Connecticut Medical Society, L. S. Paddock, M. D., James B. Whitcomb, M. D., and C. E. Hammond, M. D.

At this meeting, George F. Barker, M. D., was nominated as Professor of Physiological Chemistry and Toxicology, and Moses C. White, M. D., was nominated as Professor of Pathology and Microscopy in the Medical Institution of Yale College.

Your Committee would also Report—

That a meeting of the Joint Committee of the Corporation of Yale College and the Connecticut Medical Society was held agreeably to the call of the President of Yale College, at his rooms in New Haven, April 3d, 1868. There were present, on the part of the Corporation of Yale College, Theodore D. Woolsey, D. D., LL. D., His Excellency Gov. James E. English, and Rev. Hiram P. Arms, M. D., and on the part of the Connecticut Medical Society, Samuel T. Salisbury, M. D., James B. Whitcomb, M. D., and J. B. Lewis, M. D.

A vote by ballot was taken to nominate a Professor to fill a vacancy occasioned by the decease of Worthington Hooker, M. D., Professor of the Theory and Practice of Medicine, which resulted in the unanimous nomination of Charles L. Ives, M. D., to fill said vacancy.

All which is respectfully submitted.

On behalf of the Committee of the Conn. Medical Society.

SAMUEL T. SALISBU Y

APPENDIX D.

Report of the Committee on Medical Education.

The Committee on Medical Education, to whom was referred the Circular recently issued by a Convention of Delegates from Medical Colleges, which assembled at Cincinnati, May 3, 1867, to consider the subject of a revised system of Medical Education, beg leave to report—

That they have examined the Circular issued by said Convention, and also the reply to the same by the Faculty of the Medical Institution of Yale College, a copy of which has been read to this Convention and referred to your Committee. Your Committee fully approve of the reply given by the Faculty of Yale College, and, in addition, would state their belief, that for reasons therein given, a change so revolutionary and uncalled for by the existing exigencies of the country as the one proposed by the Cincinnati Convention, whose views are set forth in the Circular dated Chicago, Aug. 1, 1867, would operate unfavorably upon the interests of the College with which this Society is associated, as well as many others in the country; and that, judging from past experience, it would fail of general, and much more of universal, adoption.

ISAAC G. PORTER,
J. G. BECKWITH,
GEORGE BLACKMAN,
} *Committee.*

The Faculty of the Medical Institution of Yale College, transmit to the President and Fellows of the Connecticut Medical Society, the accompanying Circular issued by the Convention of Delegates from Medical Colleges, held in 1867, at Cincinnati, "for the purpose of revising the system of Medical College instruction in this country," together with their reply thereto.

The following Resolutions of the Convention embody the proposed changes in the plan of Medical Teaching:

"*Resolved*, 1st. That every student applying for matriculation in a Medical College, shall be required to show, either by satisfactory certificate, or by direct examination by a committee of the Faculty, that he possesses a knowledge of the common English

branches of education, including the first series of mathematics, the elements of the natural sciences, and a sufficient knowledge of Latin and Greek to understand the technical terms of the profession; and that the certificate presented, or the result of the examination thus required, be regularly filed as a part of the records of each Medical College.

2d. That every medical student shall be required to study four full years, including three regular annual courses of Medical College instruction, before being admitted to an examination for the degree of Doctor of Medicine.

3d. That the minimum duration of a regular annual lecture term, or course of Medical College instruction, shall be six calendar months.

4th. That every Medical College shall embrace in its Curriculum the following branches, to be taught by not less than nine Professors, viz:—

Descriptive Anatomy, including Dissections; Physiology and Histology; Inorganic Chemistry; Materia Medica; Organic Chemistry and Toxicology; General Pathology, Therapeutics, Pathological Anatomy, and Public Hygiene; Surgical Anatomy and Operations of Surgery; Medical Jurisprudence and Medical Ethics; Practice of Medicine; Practice of Surgery; Obstetrics, and Diseases of Women and Children; Clinical Medicine and Clinical Surgery; and that these several branches shall be divided into three groups or series, corresponding with the three courses of Medical College instruction required.

The first, or *Freshmen series*, shall embrace Descriptive Anatomy and Practical Dissections; Physiology and Histology; Inorganic Chemistry, and Materia Medica. To these the attention of the student shall be mainly restricted during his first course of Medical College instruction, and in these he shall submit to a thorough examination by the proper members of the Faculty, at its close, and receive a certificate indicating the degree of his progress.

The second, or *Junior series*, shall embrace Organic Chemistry and Toxicology; General Pathology, Pathological Anatomy, Therapeutics, and Public Hygiene; Surgical Anatomy and Operations of Surgery; Medical Jurisprudence and Medical Ethics. To these the attention of the medical student shall be directed during his second course of Medical College instruction, and in them he shall be examined, at the close of his second course, in the same manner as after the first.

The third, or *Senior series*, shall embrace Practical Medicine; Practical Surgery; Obstetrics and Diseases peculiar to Women and Children; with Clinical Medicine and Clinical Surgery in a Hospital. These shall occupy the attention of the student during his third course of College instruction, and at its close he shall be eligible to a general examination for the degree of Doctor of Medicine.

The instruction in the three series is to be given simultaneously,

and to continue throughout the whole of each annual College term; each student attending the lectures on such branches as belong to his period of progress in study, in the same manner as the Sophomore, Junior and Senior Classes, each pursue their studies simultaneously throughout the Collegiate year, in all our Literary Colleges.

6th. That every Medical College should immediately adopt some effectual method of ascertaining the actual attendance of students, upon its lectures and other exercises, and at the close of each session, or of the attendance of the student, a certificate, specifying the time and the courses of instruction actually attended, should be given, and such certificate only should be received by other Colleges, as evidence of such attendance."

The questions to which the Faculty were requested to respond, were—

"1st. Do your Faculty, together with the governing authority of your College, approve of the several propositions as a whole?

2d. If you do not approve of the plan of revision, as a whole, what changes would you suggest?

3d. If you approve of the plan as a whole, or of all its essential features, will your College be ready to adopt it practically, and issue your Annual Announcement for the College term of 1868–9, in accordance therewith; provided all the principal Medical Colleges in this country (or at least those in the cities of Boston, New York, Philadelphia, Baltimore, Richmond, Charleston, New Orleans, Louisville, Cincinnati, St. Louis, Chicago, Buffalo, and Albany) will agree to do the same at the same time?"

N. S. DAVIS,
S. D. GROSS,
GEO. C. BLACKMAN,
F. DONALDSON,
} *Committee.*

CHICAGO, Aug. 1st, 1867.

MEDICAL INSTITUTION OF YALE COLLEGE,
New Haven, April 4, 1868.

N. S. DAVIS, M. D., Chairman of Committee of Medical Teachers' Convention:

DEAR SIR,—The Circular issued by your Committee, presenting to the Faculty of the College the several propositions adopted by the Convention of Medical Teachers, held last year at Cincinnati, and soliciting definite action thereon, to the end that they may be simultaneously and practically adopted throughout the whole country, has been fully considered by the Faculty; and the undersigned have been directed to transmit to your Committee the following reply. In doing so, however, we cannot neglect the opportunity of expressing, both for our colleagues and ourselves, our active sympathy with every well considered movement, having

for its object the improvement of the profession; and particularly the elevation of the standard of education, both general and professional, which is necessary to secure admission to its ranks; and our high appreciation of the efforts of the gentlemen engaged in the recently renewed attempt to attain that object,—for it is a work that this College has, ever since its foundation, been actively engaged in.

The relations which this Institution sustains to the Connecticut Medical Society, by which it was originated, and to the State Legislature by which it was chartered and made one of the Departments of Yale College, are such that any radical change in its plans of instruction cannot be suddenly or easily effected.

This is not the first occasion on which this College has been solicited to change entirely its curriculum of study, as well as the prerequisites for graduation. More than forty years ago, as doubtless your Committee are aware, the Connecticut Medical Society sent representatives to a Convention of Delegates from Medical Societies and Colleges, held at Northampton pursuant to a call issued by the Medical Society of Vermont, for the purpose of devising plans for elevating the character of Medical Education. After discussing the various "subjects" which had been suggested by the circular of the Vermont Society, and such as were proposed by members of the Convention, certain regulations (twelve in number) were adopted, together with by-laws and resolves, providing for making known to the several Medical Colleges and Societies of the United States, the results of their deliberations, and for their ratification of them.

As your Committee are doubtless familiar with the proceedings of the Convention, it is unnecessary to do more than to allude to the very clear and forcible presentation of the arguments by which their propositions were enforced; or to enter into a detailed statement of the changes proposed, further than to mention that "each candidate for a license to practice, or for the degree of Doctor of Medicine, was required to present satisfactory evidence that he had received from some respectable College, the degree of Bachelor of Arts; or, that *previous to the commencement* of his professional studies, he had acquired a good English education, and such knowledge of the Latin language as to enable him to read with facility the Æneid of Virgil, and the Select Orations of Cicero; and that he had also obtained a good acquaintance with the principles of Geometry and Natural Philosophy." Such stu-

dents as were regular graduates of Colleges, were required to study for *three* years, and attend two courses of public lectures; those who were not graduates of Colleges, were required to study *four* years.

The records of the Connecticut Medical Society show that it adopted, unanimously, the recommendations of the Convention; and entering, at once and heartily, into the movement to advance the standard of medical education, it procured, at some trouble, the necessary alterations of the laws of the State, and the charter of the Medical College, so as to conform them to the new system. The Faculty earnestly seconded these efforts, and their action was made to conform to the standard demanded by the Northampton Convention of 1827.

The new system was faithfully pursued by this College for three consecutive years, and until it became evident that the solemn compact was no longer regarded by the other Medical Colleges who had taken part in the Convention, or subsequently signed the agreement. One after another, they refused to be bound by their own regulations, until finally, this Institution, according to the traditions of the fathers, found itself standing alone—"*faithful among the faithless*"—in this combined effort to advance the true interests of Medical Education in the United States.

Seeing that her students were attracted away to other institutions, which practically ignored the new regulations, to which they had all pledged themselves, and finding that a longer perseverance in the extended course of instruction would not only injure the Institution, but fail to be of any benefit to the cause of medical education, the Connecticut Medical Society, in 1832—

Voted, "That the Committee on the term of study, report to the General Assembly a bill in due form, for an Act to alter the term of study, making the time required, the same as by the law in force previous to the Convention at Northampton in 1827."

The bill, as presented, became a law the same year, and the term of study in this Institution has remained until the present time unchanged.

In regard to the first and *third* questions of the Circular, then, we are decided to answer them in the negative. In reply to the *second* question, we are convinced, that although the propositions of the Committee are in themselves unobjectionable, they are inadequate as a remedy for the great evils of the present system of education. The great salient evils of this system are, in our opin-

ion,—1st, The almost total absence of adequate *preparatory* education in the young men who enroll themselves as students of medicine.

2d. The fact, that the greater proportion of these receive no instruction whatever, worthy of the name, nor indeed accomplish any systematic study, in the proper sense of that term, *before* they listen to public lectures, if they ever do.

3d. Too great prominence is always given to public lectures, and too little to *daily text-book recitations*. Moreover, the student who comes fresh from the plough and the work-bench, with only the preparatory education that a district school affords, or the shrewdness acquired in some business pursuit, receives his degree after the same term of study as is required of the most thoroughly disciplined graduate of a University. Such a palpably absurd regulation as this, requires no comment.

In order to remedy, so far as its influence could reach, the *first* evil enumerated, the Connecticut Medical Society, many years ago, resolved in substance, that hereafter no young man should be received into the office of any of its members, as a student of medicine, until he had passed a satisfactory examination by his instructor and one of the Fellows of the Society, in the leading branches of English education, also in the Greek and Latin languages. In effect, very nearly the examination that was then required for admission to the Freshman Class in Yale College. This was placing the standard so far above the demands of other Colleges, and even of the profession in other States, that it soon became, and still remains, inoperative; although we think that at some future time it can properly be revived.

Third. The system of teaching medicine by daily text-book recitations and familiar lectures, combined with Hospital facilities, through a large part of the year, which, in addition to the courses of public lectures, is in successful operation in this College, we believe to be the only proper one, and that it ought to be generally adopted. No student should be graduated, anywhere, unless his studies have been systematically and faithfully pursued, under the direction of competent teachers. If students thus educated can only be admitted to graduation after three years of constant application, when ought those to graduate who read medicine as many do, without recitations of any kind, and with only nominal instruction?

It is not an extension of the lecture-term to six months, nor yet a great multiplication of the subjects of study, that can lessen the great evils that we all feel do exist. The only change that can reach them, is the absolute requirement of greater preparatory knowledge, and the adoption of the system of daily teaching in classes, in public institutions, instead of the loose and indefinite one that now so generally prevails in the offices of physicians.

As evidence, if any were needed, of our desire to advance, as far as practicable, the standard of medical education, we will mention the fact, already known to your Committee, that we have it in contemplation, at no distant day, to perfect plans already in process of completion, by which the Medical Sciences will be taught here, as the other sciences are taught, to graded classes, by daily text-book recitations and lectures, throughout the Academic year.

In a democratic country like ours, where educational interests are in no sense fostered or controlled by a central government, and where the quality of education, as of other things, is regulated by the public demands, the attempt to bring all Medical Colleges to adopt the same greatly advanced and prolonged course of study, and to compel all students to come up to that standard, *before the public mind is sufficiently educated to appreciate and demand it*, is in our judgment premature, and not likely to prove successful.

While, for these and other reasons, the Faculty deem it inexpedient to adopt, at present, the recommendations of the Convention, they will be prepared to give them a favorable consideration, and to adopt them, so far as our circumstances will allow, *whenever they are adopted, and faithfully adhered to, as the uniform and settled practice of the leading Medical Colleges of this country.* Appreciating fully your zeal and devotion in the cause of medical education, which we ourselves have so much at heart, and hoping to see the day when our ideal in this regard may be realized, we are, with great respect and esteem,

Respectfully yours.

S. G. HUBBARD, M. D.,
M. C. WHITE, M. D.,
Committee of the Faculty.

APPENDIX E.

Report of Delegate to New Jersey.

The undersigned, one of the delegates, appointed to attend the Convention of the Med. Soc. of N. J., would respectfully report, that he was present, accompanied by Dr. J. H. Beecher, at the 1st Annual Meeting on the 2d century of the existence of that Society.

On the arrival of your delegates, the convention was holding its sessions in the Common Council Chamber of the City of Newark. The civil authorities of which city, had not only freely tendered them accommodations, but had manifested so just and proper an appreciation of the valuable services of our profession to the public, that they were prompted to entertain them on the first evening of their assembling, with a most hospitable reception. It was not the good fortune of your delegates to be present on that occasion, nor to hear the address of the President, which is the first business of the Convention after its organization.

On the following morning, the delegation from this Society was most kindly welcomed and invited to participate in the discussions.

There were present also delegates from the corresponding Societies of Massachusetts and New York, and other gentlemen distinguished in our profession from other States. At the hour appointed, in the regular order of business, for the reception of delegates, the representatives of the different Societies were called upon in turn, and duly responded each in behalf of their own societies. During this hour, the interchange of good feeling and hearty encouragement of each other in advancing the interests of our profession, was one of the most pleasant features of the meeting.

The New Jersey Medical Society is the Senior organization in this country. In entering upon its 2d century, it obtained from the Legislature a new Charter, and under an improved reconstruction begins another centennial period with freshened vigor and renewed vitality. The long and honorable career of this most venerable association, is of itself, sufficient to engage the attention of its younger sisters, but when in entering upon another hundred years, it makes it the occasion to clothe with a new dress and new appointments the accumulated experience of the many generations through which it has existed, it gives an additional interest to observers.

It would reasonably be expected that in the new organization would be found the nearest approximation to a faultless system that such associations are susceptible of.

If the unflagging interest of the members in the proceedings at the Convention, during the long and uninterupted session from 9 A. M. until 3 P. M., affords any evidence of success, your reporter begs leave to bear witness that they have attained it.

An important feature in the proceedings which I cannot refrain from mentioning as worthy of imitation in some degree in other Societies, is their "Standing Committee," the Chairman of which is required to report "the general state of health of the citizens of N. J., during the preceding year, the causes, nature and cure of epidemics, (if any have prevailed), curious medical facts, discoveries, and remarkable cases," in short, any and every thing possessing professional interest. And to promote this object it is made the duty of each district society, through a reporter, to furnish the Standing Committee with all the information which may present relative to those subjects within the bounds of the respective societies. In this manner, a most interesting and instructive annual record is kept of the medical history of the State.

A paper was read by Dr. J. V. Schenck of Camden, founded upon a case of Thrombosis occurring in his practice, which elicited much attention. Dr. E. M. Hunt of Metuchin read a very ably written and interesting paper on "The Public Health."

Reports and debates exciting much interest and zealous earnestness fully occupied the time until a little before the hour appointed for adjournment, when the election of officers for the ensuing year was announced in order. your reporter, accustomed only to our Connecticut ways of performing this tedious ceremony, must confess to some surprise at observing with what facility it was accomplished. By the agency of a nominated committee appointed by a most equitable method early in the session, every officer, committee and delegate was elected in less than thirty minutes.

Your reporter would beg leave to suggest in this connection whether the repeated attempts to change some objectionable features of our system ought to be abandoned without one more effort.

Adjournment succeeded the election; immediately after which the whole Convention proceeded in a body to a neighboring hotel, where a dinner provided on a most liberal scale completed in a cheerful way the social enjoyment of the occasion, and where, after the cravings of the inner man had been satisfied with the substantial comforts of the table, the entertainment was prolonged for another hour or two by what the poet terms "the feast of reason and the flow of soul."

C. A. LINDSLEY.

EDITORIAL NOTICES.

At the Convention held May 1868 it was

Resolved, (See Proceedings page 9), That the Clerks of the several County Meetings be required to send a Report of their County Meetings (Duties of Clerks, on page 20), to the Secretary of the Conn. Med. Society, *Before the first of May* in each year.

It was also

Voted, That the Secretary be directed to publish a *Programme of Arrangements* for the Annual Convention, and send a copy of the same to every member of the Society, with a special invitation to each member to be present at the Convention.

The Committee of Publication would respectfully suggest to the several County Meetings that the proper compliance with the above resolutions of the State Society by the Secretary, and by the County Clerks would be much facilitated if all the Annual County Meetings were held *before the middle of April* in each year, so as to give time for making out the reports in due season. By an alteration of the Charter, passed June 12, 1847, (see Proceedings for 1864, page 67), "the several County Meetings of the Connecticut Medical Society, may change the time of holding said meetings to such time as they may severally appoint."

Whereas, The Committee of Arrangements and Publication desire to examine all papers recommended for Publication and bring forward some of them to be read at the Convention, it is most earnestly requested that all members of the Conn. Med. Society, who prepare papers for publication, or to be read at the Annual Convention, should send them to the Secretary, or to some member of the Committee as early as possible, that the Committee may make out the Programme, which the Secretary is instructed to publish and distribute to *all members of the Society* before the Annual Convention.

The Conn. Med. Society are not responsible for the opinions of the writers whose papers they publish, except where reports of Committees are approved by special vote.

The Report of the Committee on Gratuitous Students is not *published* this year. Parties interested in that Report will receive all necessary information by application to the Secretary of the Convention.

The list of deaths during the past year found on page 19 of Proceedings will be seen to be incomplete. An error in the date of the death of Dr. Ten Broeck "died April 21st, 1849" will be observed. No date of his death was reported until that part of the Proceedings was printed. The Biographical sketch of Dr. Ten Broeck on page 172, was received just as the last sheet was going through the press.

The Proceedings are sent by mail to all members of the Society not in arrears for taxes; to all Honorary Members and to Delegates from other societies; to the Secretaries of other State Societies; to Editors of Medical Journals who desire them. Persons entitled to the Proceedings, who fail to receive them, are requested to send their names and Post Office address to the Secretary.

N. B. A few *extra copies* of the Proceedings are on sale at One Dollar per copy.

M. C. WHITE, *Secretary of the Conn. Med. Society.*
115 George Street, New Haven.

AMERICAN MEDICAL ASSOCIATION.

The American Medical Association is making great efforts to raise the standard of Medical Education, and improve the profession.

Every member of a Medical Association is benefitted, more or less, by these labors, and should aid the Association by taking its published Transactions. Any one who will remit by mail Five Dollars to the subscriber, shall receive by return mail a receipt, and when the volume is published, it shall be delivered, free of expense, in Hartford, New Haven, or Meriden, as directed.

R. H. CATLIN, M. D.

West Meriden, June, 1849.

P. S.—The volume for 1848 is ready for the printer, and will be issued as soon as the funds are provided.

PROCEEDINGS.

The *Seventy-Seventh* Convention of the Connecticut Medical Society, was held in Hartford, May 26th and 27th, 1868.

The Convention assembled at the Lecture Room of Allyn Hall, at 11 A. M., and was called to order by the President, S. B. Beresford, M. D.

The President appointed Prof. F. Bacon, M. D., and Melancthon Storrs, M. D., a Committee on Credentials, who after examining the returns of the County Clerks, reported that the following gentlemen were duly elected Fellows of the Connecticut Medical Society for the ensuing year, viz:

HARTFORD COUNTY.

F. A. Hart, M. D.	M. Storrs, M. D.
George Clary, "	Irving W. Lyon, "
E. F. Parsons, "	

NEW HAVEN COUNTY.

Orin W. Peck, M. D.	Frederick J. Fitch, M. D.
John Nicoll, "	J. W. Ames, "
Francis Bacon, "	

NEW LONDON COUNTY.

Ashbel Woodward, M. D.	*Ahiel W. Nelson, M. D.
*Albert T. Chapman, "	*A. B. Haile, "
*John Gray, "	

FAIRFIELD COUNTY.

Samuel S. Noyes, M. D.	*A. L. Williams, M. D.
Lewis Richards, "	*Elijah Gregory, "
Samuel Lynes, "	

* Absent.

LITCHFIELD COUNTY.

Henry M. Knight, M. D. *J. W. Phelps, M. D.
Walter S. Munger, " J. G. Beckwith, "
*George W. Bell, "

MIDDLESEX COUNTY.

Elisha B. Nye, M. D. George W. Burke, M. D.
A. B. Worthington, "

TOLLAND COUNTY.

Wm. H. Richardson, M. D. Maurice B. Bennett, M. D.
Stephen G. Risley, "

WINDHAM COUNTY.

Edwin A. Hill, M. D. Jas. B. Whitcomb, M. D.
T. Morton Hills, " William Woodbridge, "
*John Witter, "

DELEGATES FROM MEDICAL SOCIETY OF STATE OF NEW YORK.

Samuel T. Hubbard, M. D., of New York City.
Henry D. Bulkley, M. D., " " "

Officers were elected for the ensuing year, as follows, viz:

HENRY BRONSON, M. D., PRESIDENT.
CHARLES F. SUMNER, M. D., VICE PRESIDENT.
JAMES C. JACKSON, M. D., TREASURER.
MOSES C. WHITE, M. D., SECRETARY.

On motion, a Committee of one from each County was appointed by the Fellows from the several Counties respectively, who recommended the following gentlemen to fill vacancies on the Standing Committees, and they were duly elected, viz:

On Committee of Examination—Ashbel Woodward, M. D., Lucian S. Wilcox, M. D.

On Committee to Nominate Professors in the Medical Institution of Yale College—Robert Hubbard, M. D., Stephen G. Risley, M. D.

On Committee to Nominate Physician to the Retreat for the Insane—S. Hotchkiss, M. D., H. M. Knight, M. D.

On Committee of Publication—Henry Bronson, M. D., Alvan Talcott, M. D.

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* Absent.

The President appointed Irving W. Lyon, M. D., to fill the vacancy on the *Committee on Registration.*

The President appointed as *Committee on County Reviews*—Drs. J. G. Beckwith, A. Woodward and S. G. Ridley. This Committee made a report recommending that the action of New Haven County Meeting, expelling W. B. Anderson, M. D., be confirmed. This Report was adopted.

The same Committee recommended that the action of New London County Meeting granting Dr. O. E. Miner, of Noank, honorable dismissal be approved. This report was also adopted.

The President appointed the following Committees, viz:

Committee to Nominate Delegates to the American Medical Association—Drs. A. Woodward, E. P. Parsons and E. A. Hill.

Committee on Gratuitous Students—Drs. S. S. Noyes, M. Storrs and S. G. Ridley.

Committee on Honorary Degrees and Honorary Membership—Drs. J. G. Beckwith, J. M. Ames and A. B. Worthington.

Committee on Dissertation—Drs. H. M. Knight and Lewis Richards.

The Treasurer then presented reports for the year 1868 and for the year 1869.

*Abstract of Treasurer's Report.**

May 25, 1867.	Cash in Treasury	$132.56	
May, 1868.	Cash collected during the year	337.00	
			$1,063.75
June 10, 1867.	Paid Expenses of Convention	$ 10.00	
Sept. 10, 1867.	Paid Printing Proceedings for 1867	340.58	
Sept. 10, 1867.	Paid Postage on Proceedings	3.42	
May 25, 1868.	Paid Advertising Prize Questions	25.00	
			$384.00
May 27, 1868.	Balance in Treasury		$685.75
May 25, 1869.	Received from County Clerks, during the year		454.50
			$1,240.05
July 8, 1868.	Secretary's Bill Expenses of Convention of 1868	$ 12.00	
May 27, 1868.	Paid to Committee on Russell & Jewett Prizes	450.00	
August, 1868.	Publishing Proceedings for 1868	465.90	
August, 1868.	Postage paid on Proceedings	25.00	
	Express, Stationery and Postage for Treasurer	1.83	
May 25, 1869.	Treasurer's Salary for two years	20.00	914.73
May 25, 1869.	Balance in Treasury		$325.34

* Compiled by the Secretary.

May 25, 1859.	Balance in Treasury carried to new account		$385.54
	Due from Clerks	$1,727.79	
	Deduct three-fourths for abatements, &c	1,296.84	431.95
	Leaves a total of cash and due from Clerks		$797.49
	The Society owes for Dissertators outstanding		$184.87
	Leaving a Balance in favor of the Society		$612.62

These Reports were referred to an Auditing Committee appointed by the President, viz: Drs. Francis Bacon and W. S. Mauger.

The Secretary of the Convention then stated that the Committee of Examination had placed in his hands their Annual Report, (See Appendix A.) From this Report it appeared that at the Examination for the Degree of M. D., held in January, 1859, at the Medical Institution of Yale College, Luther Hodges Wood, Ph.B., had presented a Thesis entitled "*Researches on the Influence of Mental Activity upon the Excretion of Phosphoric Acid by the Kidneys.*" To the Author of this thesis, had been awarded the Silliman Prize of Fifty Dollars, and the Committee of Examination had unanimously recommended that the Thesis should be published in the Proceedings of the Connecticut Medical Society.

On motion of Dr. White, it was voted that an abstract of the Thesis in question be read in Convention at 4 P. M.

On motion, the Report of the Committee without further reading, was referred to the Committee of Publication.

Adjourned to meet at 3 P. M.

Afternoon Session.

The Convention reassembled at 3 P. M. The President, Henry Bronson, M. D., in the chair.

The Committee of Publication reported the papers received and the arrangements for the literary exercises of the Convention, which were approved.

The Committee on Gratuitous Students made their report, which was adopted. [Persons interested in this report will receive all necessary information from the Secretary.]

On recommendation of the Committee, Lucian S. Wilcox, M.D., was appointed Dissertator for the ensuing year, and Prof. Francis Bacon, M.D., was appointed Alternate.

The following gentlemen, who were nominated last year, were

unanimously elected Honorary Members, viz: William McCullom, M. D., J. C. Hutchinson, M. D., and Benjamin Cutting, M. D.

On motion of Dr. Hutchins, of Windham County,

Voted, That the amount of $5.87 due Samuel Bowen on a Debenture bill, which has become outlawed, be paid by the Clerk of Windham County; also

Voted, That a Debenture bill of $9.30 due to Dr. D. C. Lathrop, be paid by the Clerk of Windham County, *on presentation; if not outlawed.**

The Committee on New Organization (appointed last year) reported a new form of Charter, and a complete set of By-Laws, some of which are new. The Chairman of the Committee, Dr. C. A. Lindsley, accompanied the Report with an address explaining the reasons for the various changes introduced. (See Appendix B.)

On motion the Report of the Committee on New Organization was laid on the table. By request of the Committee of Arrangements, Prof. George F. Barker, M. D., was called upon to read an abstract of the Silliman Prize Thesis by Luther Hodges Wood, Ph.B., M. D.

Prof. Barker introduced the paper by some introductory remarks on the general subject, showing that the writer had made investigations of great importance, in an almost entirely new field of Physiological research. The Professor then read an abstract of the paper in question, entitled "*Researches upon the Influence of Mental Activity upon the Excretion of Phosphoric Acid by the Kidneys.*"

Dr. White, in behalf of the Committee of Publication, reported the probable expense of printing the paper in the Transactions.

On motion of Dr. White, it was unanimously

Voted, That the Thesis of Dr. Wood, of which an abstract has just been read by Prof. Barker, be published in the Transactions of the Society.

The consideration of the Report on New Organization was then resumed, and after considerable discussion the proposed Charter was amended by inserting Section 7 of the present Charter.

It was then,

Voted, That the proposed Charter, as amended and approved by this Convention, be referred to the several County Meetings, to be approved or disapproved as a whole, by a vote of yes or no—

* The words in Italics were added to the resolutions on reconsideration at a subsequent stage of the proceedings.

County Meetings approving said proposed Charter to vote *Yes*. Those disapproving to vote *No*. The votes of the County Meetings to be reported by the Clerks to the Secretary of this Convention.

The proposed Charter as submitted to the several County Meetings, will be found in Appendix B, page 68.

On motion, it was further voted to submit the entire list of proposed By-Laws to the consideration of the County Meetings, that the Fellows elected next year, may come to the next Convention, prepared to represent the views of their constituents in regard to the adoption of the new By-Laws.

Dr. L. S. Wilcox, in behalf of the Hartford City Medical Association, invited the President and Fellows, Delegates from other Societies, and all Physicians attending the Convention, to partake of a supper at 8 o'clock this evening, at the United States Hotel.

The Auditing Committee reported the accounts of the Treasurer to be correct. The Report was approved by the Convention.

Adjourned to meet at 7½ P. M. to hear the Annual Address of the retiring President.

Evening Session.

7½ P. M. The Convention met according to adjournment. The President and Vice President being absent, the meeting was called to order by the Secretary, and Dr. J. G. Beckwith was elected Chairman.

The Annual Address was then delivered by the retiring President, S. B. Beresford, M. D., of Hartford. The subject of the Address was "The Abuse of Tobacco, and its effects upon Health."

Voted, That the thanks of the Convention be tendered to Dr. Beresford, the retiring President, for his able and interesting Address, and that a copy be requested for publication in the Proceedings of the Convention.

Adjourned to 8 A. M. Thursday.

The members of the Convention and invited guests then repaired to the United States Hotel, where they were cordially received by the Hartford Association.

Dr. Lucien S. Wilcox, President of the Association, made the following Address of Welcome:

Gentlemen of the State Medical Society, and our Distinguished Guests:—

The Hartford City Medical Society offers you this entertainment, and bids you welcome. We have seen you looking through the last and dust of the day, and now at night-fall we pray you cast in at the door of our tent, lay off your sac-

dale and tarry with us, while we bake the cakes for you and slay the kid. Some of you—possibly many—in your extensive reading—(it was before you read medicine)—remember that in the old primeval story of the patriarchs, the successful and prominent men of those times had wiped the sweat from their brows, and partaken of their lentils, and were sitting in their tent doors, at the going down of the sun, and that at that auspicious and eventful hour, God's angels appeared unto them. You remember, too, that one luckless fellow, benighted traveler that he was, as a penalty for his late work, saw from his stony pillow, his angels coming and going, not in airy form on wings, but climbing wearily up the skies, by the brick and mortar thoroughfare.

The centuries have not made this lesson old. It comes down to us fragrant with the odors of Lebanon, and strikes our ears to the watering wives of Sarah and Rachel. Let not our toil and care reach the corpse, if we would have our evening incense reach Heaven.

Here to-night, gentlemen, we are a thousand miles away from the scenes of our labors, and if it were about a thousand years since any of us wrote a prescription, as a natural consequence, our patients have all long since recovered, and it is no secret to us, that they will continue in good and perfect health, so long as they let the doctors alone. So don't let the corners of the mouth drop down, nor the lines of the face incline to a perpendicular, nor the eyes roll upward till the whites show, but let all divisions of the facial muscles be in horizontals, and let there be heard from all these tables, from all sides, long, loud, liver-lasting laughter.

Gentlemen, our "spare feast, a radish and an egg," is before you.

A blessing was here invoked by Rev. W. L. Gage, after which the dinner followed. After partaking of a bountiful repast, the following toasts were offered and responded to:

"Our Commonwealth—She is not yet in the current of 'National Degeneracy'"—Responded to by Governor Jewell and Lieutenant-Governor Wayland. Mr. Wayland, in closing, proposed the following: "The Medical Corps. (to be pronounced as spelled) its prescriptions are wisely worded in a dead language." "The Model Medical Practitioner: Allopathic as to his pills—Homeopathic as to his bills."

"Our Retiring President—He floats away gracefully amidst the smoky folds of old Virginia weed." Responded to by Dr. Beresford.

"Our Colleges—They exercise a wholesome and conservative influence upon the extreme and ultra practicality of modern education." Responded to by President Jackson, of Trinity College, and Professors Barker and Lindsley, of Yale College.

"Theology and Medicine—Handmaids in the restoration of God's best image in man." Responded to by the Rev. Mr. Gage.

"The Societies of other States—We are with them in purpose, in work and in sympathy." Responded to by Dr. Hubbard, of New York, and Professor Scott, of Montreal.

"Life Insurance—A most worthy posthumous work, possible to all men." Responded to by James G. Batterson, President of the Travelers' Insurance Company, and Mr. Bryant, Actuary of the Connecticut Mutual Life.

"Law and Medicine—Their relationship not particularly manifest." Responded to by the Hon. R. E. W. Welch.

"Our Legislators—Its liberal and intelligent endowments to charitable institutions, are its immortal part." Responded to by the Hon. David Gallup, the Hon. W. W. Welch and Dr. Beckwith.

Thursday, May 27th.

At 8 A. M., the Convention was called to order by the Vice President, C. F. Sumner, M. D.

The Committee on Honorary Degrees and Honorary Membership made their report. Proposing as candidates for Honorary Membership, Henry I. Bowditch, M. D., of Boston; Seth Shove, M. D., of New York City; Samuel T. Hubbard, M. D., of New York City. For the Honorary Degree of Doctor of Medicine, N. D. Haight, of Stamford.

By the rules of the Society, all these nominations lie over one year.

The President, Henry Bronson, M. D., arrived and took the Chair.

The Committee on Delegates to the American Medical Association and to other Medical Societies, made their report, which was adopted, as follows:

Delegates to the American Medical Association, S. B. Beresford, M. D., of Hartford; Ashbel Woodward, M. D., of Franklin; Henry Bronson, M. D., of New Haven; Gideon L. Platt, M. D., of Waterbury; Charles Woodward, M. D., of Middletown.

To the Maine Medical Association, Lewis Williams, M. D., of Pomfret; Charles M. Carleton, M. D., of Norwich.

To the New Hampshire Medical Society, J. C. Jackson, M. D., of Hartford; J. K. Mason, M. D., of Suffield.

To the Vermont Medical Society, H. M. Knight, M. D., of Lakeville; S. G. Risley, M. D., of Rockville.

To the Massachusetts Medical Society, Isaac G. Porter, M. D., of New London; Seth M. Childs, M. D., of East Hartford.

To the Rhode Island Medical Society, E. A. Hill, M. D., of East Killingly; Wm. H. Cogswell, M. D., of Plainfield.

To New York State Medical Society, Moses C. White, M. D., of New Haven; Irving W. Lyon, M. D., of Hartford; B. H. Catlin, M. D., of West Meriden; E. B. Nye, M. D., of Middletown; S. Hutchins, M. D., of West Killingly; S. S. Noyes, M. D., of New Canaan.

To the New Jersey Medical Society, C. A. Lindsley, M. D., of New Haven; G. W. Burke, M. D., of Middletown.

To the Pennsylvania Medical Society, S. G. Hubbard, M. D., of New Haven; A. B. Hulle, M. D., of Norwich; Wm. Wood, M. D., of East Windsor.

By recommendation of the Committee, it was

Voted, That Delegates to the American Medical Association, and to other Societies, have power to appoint substitutes, who may apply to the Secretary for credentials.

On motion of Dr. Beckwith, it was unanimously

Resolved, That the thanks of this Convention are eminently due and are hereby tendered to the Hartford Medical Association, for the very convenient room furnished for the sessions of the Convention, and for the sumptuous entertainment provided last evening at the United States Hotel.

The Secretary read a communication from E. P. Allen, M. D., of Athens, Pa., stating that he had been appointed a Delegate to the Connecticut Medical Society, from the Pennsylvania Medical Society, and that he had intended to be present at this Convention, but that unexpected engagements detained him at home. Dr. Allen tendered the fraternal greetings of the Pennsylvania Medical Society, with their best wishes for the continued usefulness of their sister Society in the alleviation of human suffering.

The Convention responded to the letter from Pennsylvania, by appointing Delegates to visit the Pennsylvania Medical Society, as stated in the above report on Delegates to other Societies.

Voted, That the Annual Tax be *Two Dollars*, payable June 1, 1869.

Voted, That 625 copies of the Proceedings for this year be published.

Voted, That the next Convention meet in New Haven, at 3 P. M., the fourth Wednesday in May, 1870.

The names of members of the Society who had died during the past year were read by the Secretary. See page 55.

By invitation, Dr. M. G. Echeverria read a report of a case of excision of a portion of the ulnar nerve, for the cure of a case of epilepsy. The treatment was successful. The thanks of the Convention were tendered to Dr. Echeverria, for his interesting paper.

Dr. S. G. Risley read a report of several cases of poisoning by the use of water colors. On motion, it was

Voted to publish the paper in the Transactions of the Convention.

Voted, That the Report of the Committee on New Organization, together with the Proposed Charter and By-Laws be published in the Proceedings of the Convention.

Dr. Geo. A. Ward read a paper on the Use of Veratrum Viride, which had been previously read at the New Haven County Meeting.

Dr. White read a paper on Vital Force, which had also been read at the New Haven County Meeting.

Dr. Charles M. Carleton, of Norwich, read the Annual Dissertation, on the "Use and Abuse of Spectacles."

The thanks of the Convention were tendered to Dr. Carleton, for his valuable paper, and a copy was requested for publication.

The Treasurer, Dr. J. C. Jackson, made some statements in regard to the difficulty of keeping accounts of debentures and unpaid taxes with ex-clerks.

On motion of Dr. White, it was

Voted, That Doctors Jackson and Hastings be a Committee to investigate the subject of finances, and the method of keeping the accounts of the Society, and to report to the next Convention.

On motion, the Convention adjourned.

Attest,

MOSES C. WHITE, *Secretary*.

OFFICERS OF THE SOCIETY,

FOR 1869–70.

PRESIDENT,
HENRY BRONSON, M. D., OF NEW HAVEN.

VICE-PRESIDENT,
CHARLES F. SUMNER, M. D., OF BOLTON.

TREASURER,
JAMES C. JACKSON, M. D., OF HARTFORD.

SECRETARY,
MOSES C. WHITE, M. D., OF NEW HAVEN.

STANDING COMMITTEES.

Committee of Examination.

HENRY BRONSON, M. D., *Ex-officio.*
D. H. HUBBARD, M. D.
LEWIS WILLIAMS, M. D.
IRA GREGORY, M. D.
H. W. E. MATTHEWS, M. D.
C. F. SUMNER, M. D.
ASHBEL WOODWARD, M. D.
LUCIAN S. WILCOX, M. D.

Committee to Nominate Professors in the Medical Institution of Yale College.

L. S. PADDOCK, M. D.
HENRY PIERPONT, M. D.
H. P. STEARNS, M. D.
ROBERT HUBBARD, M. D.
STEPHEN G. RISLEY, M. D.

Committee to Nominate Physician to the Retreat for the Insane.

ELISHA B. NYE, M. D.
JAMES C. JACKSON, M. D.
ISAAC G. PORTER, M. D.
SAMUEL HUTCHINS, M. D.
H. M. KNIGHT, M. D.

Committee of Publication.

MOSES C. WHITE, M. D., *Ex-officio.*
G. W. RUSSELL, M. D.
L. J. SANFORD, M. D.
HENRY BRONSON, M. D.
ALVAN TALCOTT, M. D.

Committee on Registration.

H. W. E. MATTHEWS, M. D.
S. G. HUBBARD, M. D.
IRVING W. LYON, M. D.

Dissertator—LUCIAN S. WILCOX, M. D.
Alternate—FRANCIS BACON, M. D.

MEMBERS OF THE SOCIETY.

HONORARY MEMBERS.

*FELIX PASCALIS,	New York City.
JAMES JACKSON,	Boston, Mass.
*JOHN C. WARREN,	Boston, Mass.
*SAMUEL L. MITCHELL,	New York City.
*DAVID HOSACK,	New York City.
*WRIGHT POST,	New York City.
*BENJAMIN SILLIMAN,	New Haven.
*GEORGE M'CLELLAN,	Philadelphia, Pa.
*JOHN MACKIE,	Providence, R. I.
*CHARLES ELDREDGE,	East Greenwich, R. I.
*THEODORIC ROMEYN BECK,	Albany, N. Y.
*JAMES THACHER,	Plymouth, Mass.
EDWARD DELAFIELD,	New York City.
JOHN DELAMATER,	Cleveland, O.
*WILLIAM P. DEWEES,	Philadelphia, Pa.
*JOSEPH WHITE,	Cherry Valley, N. Y.
JACOB EDGELOW,	Boston, Mass.
WALTER CHANNING,	Boston, Mass.
*PHILIP SYNG PHYSICK,	Philadelphia, Pa.
*LEWIS HEERMAN,	U. S. Navy.
*DANIEL DRAKE,	Cincinnati, O.
*HENRY MITCHELL,	Norwich, N. Y.
NATHAN RYNO SMITH,	Baltimore, Md.
*VALENTINE MOTT,	New York City.
*SAMUEL WHITE,	Hudson, N. Y.
*REUBEN D. MUSSEY,	Cincinnati, O.
*WILLIAM TULLY,	Springfield, Mass.
RICHMOND BROWNELL,	Providence, R. I.
*WILLIAM BEAUMONT,	St. Louis, Mo.
SAMUEL HENRY DICKSON,	Philadelphia, Pa.
*SAMUEL B. WOODWARD,	Northampton, Mass.
*JOHN STEARNS,	New York City.
*STEPHEN W. WILLIAMS,	Deerfield, Mass.
*HENRY GREEN,	Albany, N. Y.
*GEORGE FROST,	Springfield, Mass.
WILLARD PARKER,	New York City.
*BENAJAH TICKNOR,	U. S. Navy.
ALDEN MARCH,	Albany, N. Y.
*AMOS TWITCHELL,	Keene, N. H.
CHARLES A. LEE,	New York City.
*DAVID S. C. H. SMITH,	Providence, R. I.

* Deceased.

*JAMES M. SMITH,	Springfield, Mass.
HENRY D. BURLEY,	New York City.
J. MARION SIMS,	New York City.
*JOHN WATSON,	New York City.
FRANK H. HAMILTON,	Brooklyn, L. I.
*HUBERT WATTS,	New York City.
J. V. C. SMITH,	New York City.
O. WENDELL HOLMES,	Boston, Mass.
JOSEPH SARGENT,	Worcester, Mass.
*MASON F. COGSWELL,	Albany, N. Y.
FOSTER HOOPER,	Fall River, Mass.
*THOMAS C. BRINSMADE,	Troy, N. Y.
GEORGE CHANDLER,	Worcester, Mass.
GILMAN KIMBALL,	Lowell, Mass.
JAMES McNAUGHTON,	Albany, N. Y.
*USHER PARSONS,	Providence, R. I.
*S. D. WILLARD,	Albany, N. Y.
*JOHN WARE,	Boston, Mass.
EBENEZER ALDEN,	Roxbury, Mass.
B. FORDYCE BARKER,	New York City.
JOHN C. ADAMS,	New York City.
JARED LINSLEY,	New York City.
A. J. FULLER,	Bath, Me.
SAMUEL H. PENNINGTON,	Newark, N. J.
FREDERICK N. BENNETT,	Orange, N. J.
*THOMAS W. BLATCHFORD,	Troy, N. Y.
THOMAS C. FINNELL,	New York City.
N. C. HUSTED,	New York City.
JACOB P. WHITTEMORE,	Chester, N. H.
JOHN GREEN,	Worcester, Mass.
THOMAS SANBORN,	Newport, N. H.
WILLIAM PIERSON,	Orange, N. J.
ARTHUR WARD,	Bellevile, N. J.
HIRAM COLLINS,	Washington, N. Y.
E. K. WEBSTER, M. D.,	Boscawen, N. H.
F. A. STACKPOLE, M. D.,	Dover, N. H.
S. P. L. SIMPSON,	Concord, N. H.
A. T. WOODWARD,	Vt.
WM. McCULLOM,	Vt.
J. C. HUTCHINSON,	Brooklyn, N. Y.
BENJ. E. COTTING,	Boston, Mass.

PROPOSED FOR HONORARY MEMBERSHIP.

HENRY I. BOWDITCH, M. D.,	Boston, Mass.
SETH SMITH, M. D.,	New York City.
SAMUEL T. HUBBARD, M. D.,	New York City.

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* Deceased.

ORDINARY MEMBERS.

The names of those who have been Presidents are in Capitals.

HARTFORD COUNTY.

S. L. CHILDS, M. D., of East Hartford, Chairman.

Irving W. Lyon, of Hartford, Clerk.

HARTFORD, Henry Holmes, S. R. BERESFORD, G. B. Hawley, G. W. Russell, David Cheney, P. W. Ellsworth, E. K. HUNT, J. S. Butler,* J. C. Jackson, A. W. Stevens, Thomas Miner,* William Porter, John P. Wells, William B. Brownell, P. M. Hastings, Edward Bulkley, W. H. Tremaine, Lucius S. Wilcox, Henry P. Stearns, S. C. Preston, Irving W. Lyon, Daniel Phil. Mortimer Storrs, Horace S. Fuller, John O'Flaherty, Nathan Mayer, Wm. M. Hudson, George C. Jarvis, Morton W. Easton, W. A. M. Wainwright, E. M. Dunbar, David Cheney, Jr., George F. Hawley.

BERLIN, E. Blandegee.

BLOOMFIELD, Henry Gray.

BRISTOL, E. R. Leonard.

CANTON, Collinsville, E. H. Tiffany.

EAST GRANBY, Chester Humlin.*

EAST HARTFORD, S. L. Childs, Edward R. Brownell.

EAST WINDSOR HILL, Sidney W. Rockwell, William Wood.

Warehouse Point, Mercer L. Fisk.

ENFIELD, Thompsonville, Edward F. Pease, Roland L. Strickland.

FARMINGTON, Frank Wheeler, Charles Carrington.

Plainville, G. A. Moody.

GRANBY, (North,) Francis F. Allen.*

GLASTENBURY, H. C. Bunce.

South Glastenbury, C. E. Hammond, G. A. Hubbard.

MANCHESTER, William Scott.*

NEW BRITAIN, B. N. Comings, S. W. Hart, Geo. Clary, C. R. Hart, E. E. Lyon, J. S. Stone.

ROCKY HILL, R. W. Griswold.

SIMSBURY, Tariffville, G. W. Sanford.

Weatogue, R. A. White.

SOUTHINGTON, John S. Norton,* N. H. Byington, F. A. Hart.

SUFFIELD, Asahel Bissell,* J. K. Mason.

WEST GRANBY, Justus D. Wilcox.*

WEST HARTFORD, Edward Rose.*

WETHERSFIELD, E. P. Cook,* A. S. Warner.

WINDSOR, A. Morrison, S. L. Wilson.

* Over sixty years of age.

NEW HAVEN COUNTY.

R. H. CATLIN, M. D., of West Meriden, Chairman.

EDWARD BURLEY, M. D., of New Haven, Clerk.

New Haven, Samuel Pemberton,* A. S. Munson,* NATHAN B. IVES,* E. H. Bishop,* Levi Ives, P. A. Jewett, David L. Daggett, George O. Sumner,* David A. Tyler, HENRY BRONSON,* E. A. Park, S. G. Hubbard, H. W. E. Matthews, C. A. Lindley, T. H. Totten, John Nicoll, Moses C. White, H. Pierpont, J. H. Beecher, Leonard J. Sanford, Chas. L. Ives, Edward Dibblee, W. E. De Forest,* F. L. Dibble, T. Bevin Townsend, Geo. A. Ward, Evelyn L. Beard, T. H. Bishop, Eli W. Blake, Henry A. Du Bois, Francis Bacon, C. O. Sterkman, J. W. Barker, Charles A. Gallagher, Robert Stone, W. Lockwood Bradley, A. E. Winchell, O. F. Treadwell, H. Carrington, George F. Barker, O. W. Peck, L. M. Gilbert, J. W. Terry, George H. Shepherd, Robert S. Ives, F. J. Whittemore, Arthur Bucklyn, P. Emerson, Leopold Spier.

Fair Haven, Chas. S. Thomson,* W. H. Thomson, Wm. M. White.

Branford, H. V. C. Holcomb, Newton B. Hall.

Cheshire, A. J. Driggs, M. N. Chamberlin.

Derby, Charles D. Pinney.

Birmingham, Ambrose Beardsley.

Ansonia, C. W. Shelley.

Guilford, Joel Caulkins,* Alvan Talcott.

Hamden, Edwin D. Swift.

Madison, D. M. Webb.

Meriden, (West) R. R. CATLIN, Asa H. Churchill, James G. Bacon, Jas. J. Averill, Frederick J. Fitch.

Milford, Hall Allen,* L. N. Beardsley, Thomas Durrin.

Naugatuck, J. D. Mears,* S. C. Barker, Frank C. Tuttle.

North Branford, Sheldon Beardsley.*

North Haven, H. P. Stillman.

Orange, West Haven, J. Martin Ames, J. W. Henry.

Oxford, Lewis Barnes.

Seymour, Thos. Stoddard, S. C. Johnson, Joshua Kendall.

Southbury, A. B. Burritt.*

South Britain, L. C. Baldwin.

Wallingford, Nehemiah Banks, E. F. Harrison.

Waterbury, G. L. Platt, John Deane, George E. Perkins, Philo G. Bockwell, Thos. Dougherty, Alfred North, Edward L. Griggs.

NEW LONDON COUNTY.

ISAAC G. PORTER, M. D., of New London, Chairman.

ALBERT T. CHAPMAN, M. D., of Mystic, Clerk.

New London, Nathaniel S. Perkins,* ISAAC G. PORTER,* D. P. Francis, Robert A. Manwaring, Robert McCardy Lord, A. W. Nelson, F. W. Bronson.

Norwich, Richard P. Tracy,* Elijah Dyer,* Elisha Pitkney,* A. B. Hale, Lewis S. Paddock, Chas. M. Carleton, F. S. Arnold.

Bozrah, Samuel Johnson.*

Colchester, Ezekiel W. Parsons,* Frederick Morgan.*

Franklin, ISRAEL WOODWARD.

Griswold, Wm. Witter.

Groton, Mystic River, A. W. Coates, John Gray.

Lebanon, Ralph E. Green.*

Montville, Mason Manning,* Albert T. Chapman.

Old Lyme, Richard Noyes.*

Preston, Eleazer B. Downing.*

Stonington, William Hyde.*

Mystic Bridge, E. Frank Coates.

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* Over sixty years of age.

FAIRFIELD COUNTY.

SAMUEL S. NOYES, M. D., of New Canaan, Chairman.

GEORGE L. BEERS, M. D., of Bridgeport, Clerk.

Greenfield, Rufus Blakeman.*
Southport, James Sherwood.*
Bridgeport, William B. Nash.* David H. Nash, Robert Hubbard, H. L. W. Bartlett, Elijah Gregory, Geo. L. Beers, Andrew J. Smith, Augustus H. Abernethy, George P. Lewis, James F. Cumming, Gustave Ohmeyer.
Brookfield, A. L. Williams.
Danbury, E. P. Bennett.* James Baldwin,* William C. Bennett.
Redding, William H. Mather.
Darien, Samuel Sands.
Easton, Waite R. Griswold.
New Canaan, Samuel S. Noyes,* Lewis Richards,* William B. Stevenson.
Norwalk, John A. McLean,* Its Gregory,* Samuel Lynes, John W. McLean, James E. Barbour, W. A. Lockwood.
South Norwalk, M. B. Pardee, E. L. Higgins.
Ridgefield, O. S. Hickok.
Stamford, N. D. Haight,* W. H. Trowbridge, James H. Hoyt.
North Stamford, Geo. W. Rich.
Stratford, Roger M. Gray, B. C. Mowen.
Thomaston, George Dorr.*
Westport, George Blackman,* George E. Sanford.
Wilton, A. E. Emery.

WINDHAM COUNTY.

HARVEY CAMPBELL, M. D., of Voluntown, Chairman.

SAMUEL HUTCHINS, M. D., of West Killingly, Clerk.

Windham, Chester Hunt,* E. Huntington.
Ashford, John H. Simmons.
Brooklyn, James L. Whitcomb,* Wm. Woodbridge.
Canterbury, Joseph Palmer.
Hampton, Dyer Hughes.*
Killingly, Justin Hammond.*
South Killingly, Daniel A. Bowey.*
West Killingly, Samuel Hutchins, Frank A. Tillinghast.
East Killingly, Edwin A. Hill.
Plainfield, WM. H. CRISWELL.*
Pomfret, Hiram Holt,* Lewis Williams.
Putnam, H. W. Hough, Daniel B. Symington.
Scotland, Calvin B. Brumley.
Plainfield, Moosup, Wm. A. Lewis, Chas. H. Rogers.
Thompson, Lorell McIntosh, Charles Binford.
Voluntown, Harvey Campbell,*
Westford, Farnum O. Bennett.
Woodstock, Lorenzo Marcy.*
East Woodstock, John White.
West Woodstock, Milton Bradford.
Windham, Willimantic, Fred. Rogers, T. Morton Hills, Horace E. Bolton, L. F. Bagley.

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* Over sixty years of age.

LITCHFIELD COUNTY.

FRANCIS J. YOUNG, M. D., of Riverton, Chairman.

GEORGE W. BELL, M. D., of Litchfield, Clerk.

Litchfield, Josiah G. Beckwith,* H. W. Ball, D. F. Bostwick, Geo. W. Ball.
Northfield, D. F. W. Camp.*
Bantamtown, Riverton, Francis J. Young.
Cornwall, Burritt E. North.*
West Cornwall, Edward Swafford.
Morris, Garry H. Miner.*
New Milford, J. K. Bacon.
Gaylord's Bridge, G. H. St. John.*
Norfolk, William W. Welch, John H. Welch.
Plymouth, Samuel T. Salisbury.
Thomaston, William Woodruff.*
Roxbury, Myron Downs.*
Salisbury, John H. Hodges.
Lakeville, Benj. A. Welch.* Wm Hewitt H. M. Knight.
Sharon, Ralph Deming,* William W. Knight.
Torrington, Franus Bancroft.*
Wolcottville, Jeremiah W. Phelps, H. S. Hazelett, A. E. Barber.
Warren, John T. Beardsley.
Washington, Robert M. Fowler.*
New Preston, Sidney H. Lyman, Edward P. Lyman.
Watertown, W. S. Munger.
Winchester, West Winsted, James Welch,* John W. Bidwell.
Woodbury, Charles H. Webb, Bernon W. Sloane.

MIDDLESEX COUNTY.

IRA HUTCHINSON, M. D., of Cromwell, Chairman.

HOSEA C. HALES, M. D., of Haddam, Clerk.

Middletown, CHAS. WOODWARD,* Elisha B. Nye, George W. Burke, William B. Casey, John Ellis Blake, Rufus Ferer, F. D. Edgerton, Noah Cressy.
Chatham, Middle Haddam, Albert B. Worthington.
Chester, Sylvester W. Turner.
Clinton, Denison H. Hubbard.*
Cromwell, Ira Hutchinson.*
Durham, B. W. Mathewson.
Essex, Alanson B. Hough.* Charles H. Hubbard.
Haddam, Hosea C. Hales.
Killingworth, O. R. Reynolds.
Old Saybrook, Asa H. King.* J. E. Grannis.
Portland, George O. Jarvis, C. A. Sears.
Saybrook, Deep River, Edwin Edwards.

TOLLAND COUNTY.

CHARLES F. SUMNER, M. D., of Bolton, Chairman.

GILBERT H. PARSONS, M. D., of Tolland, Clerk.

Tolland, Oliver K. Isham,* G. H. Parsons.
Bolton, Chas. F. Sumner.
Coventry, John B. Porter,* Maurice B. Bennett.
South Coventry, Timothy Dimock,* Henry S. Dean.
Ellington, J. A. Warren.
Mansfield, Wm. H. Richardson.*
Mansfield Center, O. B. Griggs.
Mansfield Depot, Norman Brigham,* Julius N. Parker.
Somers, Orson Wood.*
Stafford, Wm. N. Clark.*
West Stafford, Joshua Hodges.*
Stafford Springs, C. E. Newton.
Vernon Depot, A. R. Goodrich.
Rockville, Stephen G. Risley, Francis L. Dutcher, N. Gregory Hall.

* Over sixty years of age.

SUMMARY OF MEMBERS, APRIL 1, 1868.

	Total.	Deaths.
Hartford County	15	0
New Haven County	83	0
New London County	78	1
Fairfield County	42	0
Windham County	29	2
Litchfield County	36	0
Middlesex County	22	0
Tolland County	38	0
	342	3

NOTE.—Former Fellows of the Connecticut Medical Society are permanent members of the Annual Convention, and take part in all the proceedings of the Convention, except the election of Officers and Standing Committees. All the members of the Society are especially requested to be present at the Annual Convention.

DEATHS OF MEMBERS DURING THE YEAR ENDING MAY 1, 1868.

New London County.

George E. Palmer, M. D., of Stonington, died May 8, 1865, of fatty degeneration of the heart, aged 68 years.

Windham County.

Asa Witter, M. D., of Woodstock, died May 8, 1868, of Pneumonia, aged 69 years.

Orrin Witter, M. D., of Chaplin, died February 4, 1868, aged 72.

DUTIES OF THE COUNTY CLERKS.

To warn County Meetings.

To record the proceedings of the County Meetings.

To collect the taxes and pay the same to the Treasurer.

To return to the Treasurer the names of Members delinquent on taxes, with the amounts severally due from each.

To transmit to the Secretary a list of the elected Fellows, and the person recommended as a candidate for a gratuitous course of lectures in the Medical Institution of Yale College, and the titles of essays recommended for publication, with the names of their authors, by the first of May in each year.

To transmit duplicate list of the Members of the Society to the Secretary and Treasurer, on or before the first day of the Convention, on penalty of five dollars for each neglect.

To report to the Secretary of the State Society, on the first day of its Annual Convention, the names, ages, and diseases of the Members of this Society who have died during the year preceding the 1st of April in such year, in their several County Societies.

RULES OF ORDER.

1. Organization.
2. Certificates of Membership presented and read by the Secretary.
3. Committee on the Election of Fellows.
4. Address of President.
5. Election of officers for ensuing year.
6. Unfinished business of previous year disposed of.
7. Reception and reference, without debate, of Communications, Resolves, &c., from the several Counties, and Members of the Convention.
8. Reading Treasurer's Report.
9. Committee to audit the same.
10. Standing Committees appointed.
11. Committee to nominate Delegates to American Medical Association.
12. Committee on Candidates for Gratuitous Course of Lectures.
13. Committee on Honorary Degrees and Honorary Membership.
14. Committee to nominate Dissertator.
15. Dissertation.
16. Reports of Committees appointed on County Communications, Resolves, &c.
17. Reports of Standing Committees.
18. Reports of Committees in the order in which business was brought forward in Convention.
19. Miscellaneous business.

APPENDIX A.

Report of the Committee of Examination.

Your Committee on examination, would respectfully report that since last meeting of this Society, two examinations have been held at the Medical College, viz: July 21st, 1868, and January 13th, 1869.

At the Commencement Examination, held July 21st, 1869, there were present on the part of this Society, H. M. Knight, M. D., D. H. Hubbard, M. D., H. W. E. Matthews, M. D., and C. F. Sumner, M. D.; and on the part of Yale College, Professors Silliman, Hubbard, Lindsley, White, Ives and Barker, and J. B. Townsend, M. D., by invitation. The President being absent, Dr. Sumner was elected President *pro tempore*.

The following persons were examined and recommended for the Degree of M. D.:—

Frank H. Fowler, B. A., Trinity, Milford. Thesis, the Digestive Function.

John Henry Granniss, Danbury. Thesis, Intermittent Fever.

The Committee having appointed H. W. E. Matthews M. D., to report the proceedings of the Board to this Society, adjourned *sine die*.

The Annual Examination was held at the Medical College, January 13th, 1869.

Present on the part of the Society, Samuel B. Beresford, M. D., President *ex-officio*; H. M. Knight, M. D., P. M. Hastings, M. D., D. H. Hubbard, M. D., L. Williams M. D., I. Gregory, M. D., H. W. E. Matthews, M. D., and C. F. Sumner, M. D.; on the part of Yale College, Professors Silliman, Hubbard, Lindsley, Bacon, White, Ives, Sanford and Barker.

The following persons were examined and recommended for the Degree of M. D.:—

George Whitfield Benjamin, M. D., New Haven. Valedictory.

David Crary, Hartford. Thesis, Carbolic Acid.
John Morgan, Hadlyme. Thesis, Scarlatina.
Byron Wooster Munson, Seymour. Thesis, General Practice.
Daniel Pole, Hartford. Thesis, Scarlatina.
Gould Abijah Shelton, Huntington. Thesis, Diphtheria.
Hanford Lyon Wixon, New Haven. Thesis, Phthisis.
Luther Hodges Wood, Ph.B., New Haven. Thesis, Researches on the Influence of Mental Activity upon the Excretion of Phosphoric Acid by the Kidneys.

The following Resolution was unanimously passed.

Resolved, That the report of the Committee awarding the Silliman Prize of $50 to Luther H. Wood, Ph.B., for his Memoir entitled as above, be accepted by the Board of Examiners, and that the publication of the same in the Transactions of the Connecticut Medical Society be recommended.

In the evening, the usual public exercises were held at the College. The President of the Board being absent, Dr. Lewis Williams was chosen to preside. Dr. E. K. Hunt of Hartford delivered the annual address to a large audience. Luther H. Wood, of the graduating class, read the Prize Essay. G. W. Benjamin delivered a Valedictory address, which was unusually able and appropriate. The Silliman Prize was presented with a few appropriate remarks by President Williams, and the Degrees were conferred by President Woolsey.

Some of the candidates did great honor to themselves as well as instructors, in the rigid examination to which they were subjected, and the few who did not, failed apparently from the want of that preliminary education and mental training, which is essential to successful progress in advanced studies. Those who had availed themselves of the advantage of the Summer School of the Institution, illustrated in a marked manner, the value of systematic training by recitations.

Respectfully submitted,

H. W. E. MATTHEWS, *Secretary.*

New Haven, May 25th, 1869.

APPENDIX B.

Report of the Committee on Organization.

MR. PRESIDENT,—Your Committee to whom was referred the report of the last "Committee on Organization," beg leave to present the following:

It has been found impossible for the Committee to hold frequent meetings, owing to the fact that the members of it were chosen from widely distant and remote parts of the State. But notwithstanding this disadvantage, by means of correspondence, and one protracted session of several hours, at which all the Committee were present except one, we are enabled to report with great unanimity a scheme for your consideration, which your Committee present with much confidence that if adopted, it will prove in its workings eminently satisfactory.

The most superficial survey of our present Organization will reveal so many defects and incongruities, particularly in the Charter of the Society, that it will be at once apparent that any important and really useful change can only be effected by a repeal of that ancient and time-honored instrument, and by reorganizing so as to more in accordance with the circumstances and spirit of the age.

As is well known the need of some change has been felt for a long time, and the conviction of its necessity has been forcing itself upon the minds of members with increasing intensity with every Annual Convention. Attempts from time to time have been made to introduce improvements but the attempts have failed, not because the need of it is disclaimed, not because a complacent satisfaction with our present status prevails, but in the opinion of your Committee, because *too little* rather than too much was attempted. The changes proposed did not reach the whole difficulty. They did not therefore, recommend themselves to the sense of the Society as adequate to accomplish the objects aimed at. They were at best but temporizing expedients, palliating merely the

evils of a defective and bad organization, not removing defects or radically correcting these evils.

Your Committee are entirely persuaded that no real improvement in our organization can be effected so long as we are hampered and checked in every direction, by the absurd restrictions and limitations of our present charter. Your Committee therefore, earnestly recommended, that petition be made to the Legislature, now in session, for its repeal, and for the granting of a new Act of Incorporation, on a voluntary basis. Much the greater part of the present Act ought properly to be in the form of By-Laws, subject to the dictation of the Society, as the changes of time, and current events may require.

The exclusive privileges which the charter originally granted to the members of the Society have long since been removed. It is quite time that the hindrances and restraints put upon us by reason of those privileges, should be removed also.

Your Committee has acted upon the presumption that this sentiment would meet with general if not unanimous approval, and has accordingly prepared a revision of the Charter and By-Laws which revision in accordance with that idea has been printed and placed in your hands, and is most respectfully submitted for your consideration.

It may be proper briefly to allude here to the more important changes which it has been thought best to propose. It will assist those who have not carefully perused it and compared it with the old, in comprehending the general outline and prominent features of this new organization which is now offered for your adoption.

1. Only the 1st and 7th Sections of the old charter have been retained unchanged.

2. As in the old so in the new, it is provided that the President and Fellows shall have the management and superintendence of the Society.

3. This body, President and Fellows, is composed as before of the Officers of the Society, and the Elected Fellows, with provisions for increasing the number heretofore allowed.

4. No person is eligible to membership who has not received the degree of Doctor of Medicine; finally, all the other provisions contained in the old charter which your Committee thought worthy of retaining have been embodied in the By-Laws. The proposed Charter is very simple, and yet sufficient for all purposes for which such an instrument is designed.

In the By-Laws, the first important change met with, is the provision for two distinct and separate assemblies. One, the Annual Meeting of the President and Fellows, the other the Annual Convention. The first corresponds essentially to our present meeting, and its objects are identical, viz: to transact the routine business of the Society, and to have concern for its good regulation and its general interest. The second, the Annual Convention occurs upon the day following the other, and is the assembling en masse of the whole body of the Society, and its object is both literary and social. This will be the occasion for the presentation and reading of papers on medical topics, for debates and discussions on questions of professional interest, and reports on subjects of scientific inquiry. It will also afford opportunity for the cultivation of better personal acquaintance with each other, for the interchange of individual thought, for the renewal of past friendship and the formation of new ones, and especially it is hoped, will afford nourishment and strength to the sentiment of *esprit de corps*, which by reason of the almost complete isolation from each other in consequence of the continuous practice of our art, has with too many of us but a feeble growth, and with some a most doubtful and unreliable vitality. The more to promote the social character of the convention and its good influences, your Committee recommend that the exercises of the day terminate with a dinner, to which every member of the Society is welcome, and to which we all sit down together as one great and happy family. As the chairman of our last Anniversary dinner wisely remarked, "If men would love one another, they must dine together." "Suspicion, jealousy and selfishness grow out of isolation. Social intercourse wears off the angular points of character, and calls forth the better qualities of our nature, humanizes, harmonizes, liberalizes." Your Committee believe the Anniversary dinner will prove both a popular and useful adjunct to the new organization.

Some unfamiliar names appear in the report. County Associations instead of County Meetings, and President in lieu of Chairman, occurs, and for the purpose of exciting more interest in the County Associations, the Presidents of them are made *ex-officio* Vice-Presidents of the Society.

The chapter of the By-Laws under the head of "Local Associations," introduces another new feature, viz: The permission of other Medical Organizations than those of Counties to send rep-

resentatives to the meeting of the President and Fellows. The introduction of this measure arose from several causes. The present Charter which dictates the method of representation was adopted three quarters of a century ago, when there was not so much disparity in numbers in the different counties, and when many other circumstances made that system expedient. But at the present time it seemed to your Committee but just and proper that the representation should bear some relation to the number represented, and still it did not seem desirable to make the number of Fellows strictly pro rata, as that would give nearly one half the Fellows to Hartford and New Haven Counties. And thus the expedient of permitting Fellows from the Local Associations was suggested as a compromise. It was also believed that this would be a healthy stimulus to all the larger cities in the State to organize Local Societies, and by their common relationship with the State Society, she would serve as a bond of union, connecting all together, and thus developing a deeper and more active interest in her and in each other.

In the mode and time of Election your Committee flatter themselves that they have introduced a valuable improvement. The By-Laws upon that point are so definite as to require no explanation.

In this connection it will be appropriate to speak of the leading influences which controled and guided your Committee in their action.

The first effort of the Committee was to establish in their own minds, just what is the prevailing, prominent sentiment and wish of the Society. The subject has been agitated, it has been viewed and discussed from various stand points, thought and expression have had full time and play—now what is the result? what impress has all this left upon the Society as a whole? To determine this, opinions were sought from those who had exhibited interest in, and given attention to the matter, it was made the subject of conversation whenever opportunity favored it,—regard was had for the drift and tendency of the discussion on the question one year ago at New Haven, and the result of these varied enquiries was, the fixed conviction in the minds of your Committee, that the chiefest and most general wish of the Society is that there shall be at least one day annually when all the members of the Society can come together to promote the interests of our Profession and the noble art we practice, upon an exact equality—where there

shall be no distinctions of voting or speaking, or any other privileges that are not common to all.

To gratify this wish was then the proper object your Committee aimed at. Upon it, as the grand central point they hinged all their action. They sought to adapt the minor details of proposed changes to the most successful achievement of this result, viz: a Mass Meeting of the Society.

The present system of Fellowship has been retained as affording as well as any other method, the proper appliances for the systematic and orderly conduct of this Convention; and besides, regard was had for the conservative feelings of many, who would hesitate to abolish a familiar and time-honored custom, merely for the sake of change.

If members will analyze the different parts of the work which the Committee had to do, they will better appreciate the influences guiding them and the success of their efforts. Assume these facts.—The primary and ultimate object of the Society is the advancement of the interests of medicine. This will be most successfully effected, it is believed, by a full and free assembling of all its advocates in council. Your Committee are appointed to organize that assembly. Because such an assembly unorganized, and with no provision for its control and direction, would be a mob—moderate and even genteel, perhaps, but nevertheless a mob. Wanting direction and order, it would be a disorderly assembly, and that is a mob.

The experience of all civilization teaches that large bodies of men organized into societies, having regular periodical meetings, are successful in their management and conduct, only by means of what might be called the machinery of the society. There are certain routine acts common to all organizations of this kind, which can be best performed by the few picked men, selected and delegated for that purpose. Hence the invention of committees for the despatch and ready execution of such business. They are absolutely essential and indispensable to the successful working of societies. It is such a relation to the Society that the President and Fellows bear. They constitute a grand Committee, charged with the care of doing whatever may be necessary for the well ordering and harmonious working of the Annual Convention. They are wholly subservient to that. They hold the same relationship to it that the domestics of a household do to the family. As they perform those menial services necessary to the comfort

and enjoyment of the family, so do the President and Fellows perform such duties as are beneath the dignity of the whole Convention, and yet are indispensable to the ready and harmonious exercise of the higher functions of that body. These remarks are made because some minds have been confused in understanding the relations of these two bodies to each other, and the purpose and intention of the Committee in proposing them.

The functions of the two bodies are entirely separate and distinct.

We have thus briefly passed in review the most prominent distinctive characteristics of the proposed plan of reorganization. The Committee have caused it to be printed, in accordance, it was conceived, with the "instructions to put the subject in proper form for final action by the next Convention." They do not present it claiming that it makes any close approximation to perfection. They do not anticipate an approval of it in all its details. It is not in the nature of such a work to be regarded by different minds in the same light or with any degree of unanimity. Your Committee are not so sensitive, either, as to have their feelings wounded by any just and proper criticisms of their work. Indeed they would themselves suggest amendments of several minor points. But in the leading and essential features of the plan they have aimed to, and they believe they have given expression to the prevailing sentiments and wishes of the Society. They regard themselves as acting in the character of accoucheurs, aiding in the delivery of what was already conceived in the womb of the Society, and while they do not regard this production as exclusively their own child, still they feel such an interest in it that they would dislike to see it so much mutilated and abused as to be fatal to its life. As it is, however, it is most respectfully submitted.

C. A. LINDSLEY,
H. M. KNIGHT,
L. S. WILCOX,
I. G. PORTER,
} *Committee.*

PROPOSED CHARTER

OF THE

CONNECTICUT MEDICAL SOCIETY.*

Sec. 1. Be it enacted, &c., That the Physicians and Surgeons now members of the Connecticut Medical Society, and all Physicians and Surgeons who shall be associated with them in pursuance of the provisions of this act, shall be and remain a body politic and corporate, by the name of THE CONNECTICUT MEDICAL SOCIETY; and by that name they and their successors shall and may have perpetual succession; shall be capable of suing and being sued, pleading and being impleaded, in all suits of whatever name and nature; may have a common seal, and may alter the same at pleasure; and may also purchase, receive, hold and convey any estate, real or personal, to an amount not exceeding one hundred thousand dollars.

Sec. 2. And be it enacted, That the superintendence and management of the Society shall be vested in a body to be known and called by the name of "The President and Fellows of the Connecticut Medical Society;" which body shall have power to prescribe the duties of its officers and members, and fix their compensation; to establish the conditions of admission, dismission and expulsion; to lay a tax from time to time upon the members, to collect the same, and to hold and dispose of all moneys or other property belonging to the Society, in such manner as they may think proper to promote the objects and interests of the Society; and in general, to make such by-laws and regulations for the due government of the Society, not repugnant to the laws of the United States, or of this State, as may be deemed necessary.

Sec. 3. And be it enacted, That the President and Fellows of the Connecticut Medical Society shall be composed of the officers of the Society for the time being, and of Fellows, (not less than three) chosen by and from each of the County Societies, now existing, and of Fellows chosen by and from such other medical organizations within the State as the President and Fellows may hereafter recognize and allow to be represented among them.

Sec. 4. And be it enacted, That hereafter no one shall be admitted to membership, in any County or other Society having connection with this Society, unless he shall have received the degree of Doctor of Medicine, or been admitted *ad eundem*, from such medical authorities as this Society shall deem proper to recognize; provided, that this shall not be construed so as to prohibit any person from becoming a member of any local society connected with this, who has received

* By order of the Seventy-seventh Convention of the Connecticut Medical Society, the following proposed Charter is submitted to the several County Meetings, to be approved or disapproved by a vote of Yes or No on the Charter as a whole. The votes of the several County Meetings to be reported to the Secretary before the next Annual Convention.

the degree of M. D. in any school recognized by, or in affiliation with the "American Medical Association," previous to the passage of this act.

Sec. 5. It shall be the duty of the several clerks of the county meetings, in their respective counties, to collect and pay over to the Treasurer of the Society all such taxes as shall from time to time be laid by the President and Fellows, upon the members of the Society as aforesaid; and for that purpose said clerks may procure a warrant under the hand of a justice of the peace, against such member or members of the Society as shall neglect or refuse to pay the taxes so imposed upon them as aforesaid; which warrant any justice of the peace is hereby empowered to issue, and said warrant shall be directed to the sheriff or his deputies of the county in which such delinquent member or members reside; and said sheriff or either of his deputies, on receiving such warrant, may therewith proceed to enforce the collection of such tax or taxes, in the same manner, and with the addition of the same fees, as are by law prescribed and allowed to the collectors of town taxes. And if any of the clerks of the county meetings shall neglect or refuse to collect the taxes entrusted to him to collect, by the time the same are made payable, or having collected the same, shall neglect or refuse to pay the same over to the Treasurer of the Society, such Treasurer may cause a suit or suits to be instituted against such delinquent, in the name of the Society, before any court proper to try the same, and the same to pursue to final judgment; and the clerks shall be allowed and receive a compensation of five per centum on all moneys collected by them respectively, and paid to the Treasurer of the Medical Society.

Sec. 6. And be it enacted, That this act shall be considered a public act, and shall take effect on the ———— day of ———— 18 ; and the act entitled an act to incorporate the Connecticut Medical Society, passed

and all supplements thereto, be, and the same are hereby repealed.

PROPOSED BY-LAWS*

OF THE

CONNECTICUT MEDICAL SOCIETY.

CHAPTER I.

Titles and Meetings.

SECTION 1. This Society shall be known by the name of THE CONNECTICUT MEDICAL SOCIETY; and it shall be composed of the members of the County Associations and of the Medical Associations of New Haven and Hartford, and such other medical associations as the President and Fellows may in future recognize, under such limitations as are hereinafter expressed, and of Honorary Members.

SEC. 2. The Connecticut Medical Society shall hold an Annual Convention on the Thursday following the fourth Wednesday in May. The Annual Convention shall assemble alternately at New Haven and Hartford. Ten members shall constitute a quorum. If the President and Vice President be absent, the Society may choose a President pro tempore.

SEC. 3. The President and Fellows of the Connecticut Medical Society shall hold an Annual Meeting.

SEC. 4. The County Associations shall hold in their respective counties an annual and a semi-annual meeting.

CHAPTER II.

Officers.

SECTION 1. The officers of the Society shall consist of a President, Vice President, Treasurer, Secretary, Committee on matters of professional interest in the State, and the Presidents of the County Associations, who shall be Vice Presidents *ex-officio*.

SEC. 2. It shall be the duty of the President to preside at the Annual Convention, and at all the meetings of the President and Fellows, preserve order, state and put questions, call for reports of Committees, enforce the observance of the by-laws, and perform such other duties appropriate to his office, as the Society shall assign him. At the annual meeting of the President and Fellows, the President shall present such matters for their consideration as he may think require attention. At the Annual Convention he shall deliver an address on some suitable subject.

SEC. 3. In the absence or disability of the President, the Vice President shall preside, and in case of a vacancy in the office of President, caused by death, re-

* The Proposed By-Laws are submitted to the several County Meetings for consideration, to take such action as may enable the Fellows from the several counties to represent the views of their constituents at the next Convention.

signation or removal, all the duties pertaining to it shall devolve on the Vice President.

Sec. 4. It shall be the duty of the Treasurer to take charge and keep a correct account of all moneys belonging to the Society, together with the receipts and disbursements, and render annually to the President and Fellows a statement of all moneys received and paid by him. He shall preserve for the benefit of the Society, all donations and other moveable property committed to his charge, and keep an exact list of the same, together with the names of the respective donors. He shall not pay any money out of the treasury, nor make any investment of the funds of the Society, or change the same, but by order of the President and Fellows. And he shall deliver to his successor all books and papers, with the balance of cash or other property of the Society in his hands.

Sec. 5. The Secretary shall have charge of the records of the Society, attend all the meetings of the President and Fellows, and the Annual Convention of the Society, record all the transactions of the same, give true copies of them, when thereto requested, conduct their correspondence, and have the custody of the seal of the Society.

He shall be required to take the following oath:

"You, A. B., being chosen Secretary of the Connecticut Medical Society, do swear that you will record all votes of the President and Fellows, and of the Annual Conventions of the Society, and give true copies when thereto requested, and faithfully perform all the duties relating to said office, so help you God."

The Secretary shall send each year an extra copy of the published "Proceedings" of the Society, to each of the Clerks, for the use of the County Societies, and to each of the other Medical Societies represented in the Convention; also to other State Societies and to Honorary Members. The Secretary shall be ex-officio chairman of the Committee of Publication.

He shall also cause a notice to be put up each year in at least three Hotels in the town in which the Annual Convention meets, stating the time and place of meeting, at least one day before said meeting.

Sec. 6. The "Committee on matters of Professional Interest in the State" shall consist of three, and be considered members ex-officio of "the President and Fellows of the Connecticut Medical Society," to be elected annually by ballot, the first named to be Chairman, whose duty it shall be, at every Annual Convention, to report the progress of our science, particularly in Connecticut—remarkable and instructive cases of disease, that may have come to their knowledge—interesting facts or discoveries relating to medicine—all circumstances connected with epidemics, (if any have prevailed,) and the treatment adopted, whether successful or otherwise—in short, whatever influences may concern the health of the citizens of Connecticut. And the more effectually to perfect this report, it shall be the duty of each County and other Association represented in this Society, annually to appoint one of its members as a Reporter, who shall furnish to this Committee, on or before the first day of May, all the information he can get relative to these subjects, within the limits of the district in which the local association exists.

Sec. 7. Any officer of the Society may, for sufficient reasons, resign his office, or may be removed therefrom by order of the President and Fellows, for neglect, inattention or mal-conduct; in either of which cases, or on the death of any offi-

ent, the President and Fellows shall supply the office vacated as soon as may be convenient.

SEC. 8. The necessary expenses of the Treasurer, Secretary, and Chairman of the "Committee on matters of professional interest in the State," shall be paid.

CHAPTER III.

President and Fellows of the Connecticut Medical Society.

SEC. 1. There shall be an annual meeting of the President and Fellows of the Connecticut Medical Society, on the day preceding the Annual Convention of the Society, and in the same City where the Convention is to be held.

SEC. 2. The President, Vice President, and ex-officio Vice Presidents, Treasurer, Secretary, Committee on matters of Professional interest, and Fellows, shall be known and called by the name of the President and Fellows of the Connecticut Medical Society; a majority of whom legally assembled together shall be a quorum for the transaction of any business; and shall have power to make by-laws for the regulation and government of the Society, and for the promotion of the objects of the same, not repugnant to the laws of the United States or of this State; to expel any member of the Society for misconduct; to make rules for the admission of members of the Society, and for their dimission from the same; to lay a tax upon the members of the Society, not exceeding five dollars in each year; to dispose of the moneys thus raised, and all other property of the Society, in such manner as they may think proper to promote the objects and interests of the Society.

The President and Fellows at any annual meeting and after one year's nomination of every candidate, and not otherwise, may, by a major vote of those present, elect eminent physicians not resident within this State, to be honorary members of this Society. But those elected shall not exceed three in number in any year.

SEC. 3. At all the meetings of the Fellows for the transaction of business, the President of the Society, or in case of his absence, the Vice President shall preside; and in case of the absence of the President and Vice President, the Fellows present may elect one of their own number as President for the occasion.

SEC. 4. The President of the Society, or in case of his death, or inability, the Vice President, on any special occasion, shall have power to call a meeting of the President and Fellows, at such time and place as he may think proper, when applied to by any five Fellows, two of whom shall be members of different County Societies, and he shall cause notice thereof to be given by the Secretary to each member, of the time and place of meeting, which notice shall be mailed at least one week previous to said meeting; and the President shall also cause twenty days' notice of the special meeting to be given in two newspapers printed in this State.

SEC. 5. The Committee of Examination, the Committee to nominate Professors in the Medical Institution, and the Committee to nominate the Physician to the Retreat for the Insane shall be chosen by ballot. Only two persons shall be elected on each of these Standing Committees each year; the first two on the list to be dropped, and the two chosen to be placed at the bottom; but any person may be re-elected. These Standing Committees of the Society shall report annually to the President and Fellows, whenever they have had occasion to act in their official capacity.

The Committee of Publication shall be three in number, of which the Secretary shall be one, and the others shall be chosen by ballot.

The Nominating Committee shall consist of one from every County and Local Association represented; and the Fellows of each of said Associations respectively, shall choose from among themselves one to represent them on said Committee. This Committee shall report at the time appointed for the election, at the Annual Convention.

All other Committees shall be appointed by the presiding officer.

Sec. 6. It shall be the duty of the Fellows of the several counties to present to the Annual Convention short obituary sketches of deceased members, which shall be revised, amended or condensed by the Committee of Publication, as they deem expedient.

Sec. 7. The President shall at an early hour of the session appoint a Committee of three Fellows, of which the Secretary shall be one, to be called the Business Committee, to whom all reports of cases, dissertations or other papers designed to be read at the Annual Convention shall be handed. And this Committee shall examine them and recommend the manner and order in which they shall be presented to the Convention.

Chapter IV.

County Associations.

Sec. 1. The members of the Connecticut Medical Society shall meet annually, and semi-annually, in their respective counties, at such times and places as have been or may hereafter be agreed upon by them: provided the annual meeting shall be at least four weeks before the fourth Wednesday in May. Each County Association shall be known and called by the name of the County in which it exists. They shall choose from among themselves a President, Clerk, and such other officers as they may find necessary. At their annual meeting, as soon as organized, they shall immediately elect, by ballot, of their own members, in each county, five, except in the counties of Middlesex and Tolland, and in each of those counties, three Fellows, to have part in the superintendence and management of the Society.

Sec. 2. The County Associations in their respective counties, shall have power to adjourn meetings and to call special meetings, from time to time, as they shall deem expedient; and they may adopt such by-laws and regulations for their own government, and for the promotion of Medical Science as they may think proper, not contrary to the laws of the State or the by-laws of the Connecticut Medical Society.

Sec. 3. Any person of good moral character, found to possess the qualifications prescribed by the Charter and By-Laws of this Society, may, by any County Association, at any meeting legally holden, be admitted to membership, by a major vote of the members present, by ballot, provided he is residing and practising in said county, and makes application for that purpose.

Sec. 4. All persons so elected, shall, within one year after such election, subscribe the By-Laws of the Society, or otherwise declare in writing, their assent to the same; or such election shall be void.

Sec. 5. Any County Association may, by a major vote, dismiss from the Society any member who shall remove from this State, or who shall leave the profession for other pursuits.

SEC. 5. Any County Association may, if it is deemed expedient, recommend to the President and Fellows for dismission from the Society, any member residing in that County, who shall apply for such dismission by a written request to that effect delivered to the Clerk of said County Association at least ten days before the time of holding any legal County meeting; and also any member who shall refuse or neglect to pay taxes; and upon the approval of such recommendation by the President and Fellows, in annual meeting, the connection between such member and the Society shall be dissolved. *Provided*, That no member shall be honorably dismissed from the Society, until all his taxes shall have been paid.

SEC. 6. All violation of the By-Laws of the Connecticut Medical Society, or of the Medical Police adopted by the Society, or of the Rules and Regulations passed by the County Association, in conformity with the By-Laws of the State Society, may be prosecuted and tried in the respective County Associations, under the following regulations, viz.:—The member accusing another of a violation of any of the before-mentioned regulations, shall make a statement, in writing of the transaction which he deems a misdemeanor, and lay the same before a Fellow of the Society; and such Fellow shall issue a notification to the accused, to appear before the next County Meeting, stating the time when and the place where it is to be held, to defend, if he sees fit, against such accusation. A copy of such accusation and notification shall be left with the accused, or at his last usual place of abode, at least twelve days previous to the time of holding the next County Meeting. And the accuser shall cause the said accusation and notification to be served and returned to the Clerk of the County Association, on or before the day of their sitting; and the offender, upon conviction, may be punished, by admonition, by suspension from the privileges of the Society for a period not exceeding two years, or by expulsion from the Society. *Provided*, That no sentence of expulsion shall be valid, until confirmed by the President and Fellows, in Annual Meeting.

SEC. 7. When a new Clerk is chosen in any of the County Associations, his predecessor shall deliver over to him all the records and papers appertaining to the office, retaining copies of the same, if he think proper.

The Clerks of the several County Associations shall take the following oath, viz.:

"You, A. B., being chosen Clerk of the . . . . . County Association, do swear that you will record all votes of said Association, and give true copies of the same when thereto requested, and faithfully perform all the duties of said office. So help you God."

SEC. 8. It shall be the duty of the several Clerks of the County Associations, in their respective Counties, to collect and pay over to the Treasurer of the State Society, all such taxes as shall from time to time be laid by the President and Fellows upon the members of the Connecticut Medical Society. And the Clerks shall be allowed a compensation of five per cent. on all moneys collected by them respectively and paid to the Treasurer of the State Society.

If any members neglect or refuse to pay the taxes legally imposed upon them, it shall be the duty of the Clerks of the County Associations to which they belong, to proceed against such delinquent members, according to law, in the collection of the same. And if any of the Clerks of the County Associations shall neglect or refuse to collect the taxes committed to him to collect, by the time the same are due; or having collected the same, shall neglect or refuse to pay the same over to the Treasurer of the State Society, such Treasurer may cause suit

to be instituted against such delinquent, in the name of the Society, before any Court proper to try the same, and the same pursue to final judgment. The expenses incurred by the Clerks of the County Associations in collecting taxes, shall be cancelled and paid by the Treasurer.

Sec. 9. The Clerks shall transmit the names and places of residence of the Fellows, and of the person recommended for a gratuitous course of lectures, to the Secretary, before the first day of May in each year, that the Secretary may have ample time to arrange the programme for the Annual Convention. They shall also forward to the Secretary, and a duplicate copy to the Treasurer, on or before the annual meeting, the names of the members in their respective County Associations, and their place of residence; and those who fail in the performance of this duty, shall be subject to a fine of five dollars, to be collected by the Treasurer.

Sec. 10. The Clerks shall transmit to the Treasurer the names of members delinquent in taxes, with the amounts severally due from each, and what notice he has given to each delinquent of his indebtedness.

Chapter V.

Local Associations.

Sec. 1. The Medical Association of New Haven and the Medical Association of Hartford, and any other medical organization within the State may be allowed, after submitting their Constitutions and By-Laws to the President and Fellows, by a vote of two-thirds of that body, to elect Fellows of the Connecticut Medical Society. The number shall not exceed the proportion of one to every ten members of their respective Associations, who are also members of the Society, as nearly as may be; and the Fellows so elected, who must be members of the State Society, shall have equal powers, privileges and rights with the Fellows chosen by the County Associations.

Sec. 2. Every Local Association, thus admitted into fellowship, shall elect its Fellows, and send a certificate thereof, signed by the Secretary, with a full list of its members, on or before the first Wednesday in May, yearly and every year; and the said Fellows shall be considered Fellows of the Connecticut Medical Society for one year, and until others shall be appointed.

Sec. 3. Each Local Association shall, when required, give evidence that it has at least ten resident members, holds stated meetings, and is not in the practice of any violation of the By-Laws and Regulations of this Society.

Sec. 4. Each Local Association shall compel the attendance of its elected Fellows at every legally warned meeting of the President and Fellows; and if any Local Association shall fail to be represented without due reasons assigned, an investigation and report of the names of such failure shall be required from the Association thus unrepresented; and upon a failure of representation for three successive years, the said Association shall be suspended until restored by a Vote of the President and Fellows.

Chapter VI.

Members.

Sec. 1. Each member of the Society shall have free access to the records of the Society, and of the County Association to which he belongs, and may take attested copies thereof if he request them.

Sec. 2. All the members of the Connecticut Medical Society have the privilege of attending all meetings of the President and Fellows, and performing all the duties of Fellows, except voting. Honorary Members shall have the privilege of a seat at the Annual Convention, and of taking part in discussions; but they shall not vote on any question, nor be eligible to any office.

Sec. 3. The payment of the annual tax shall be optional with all members over sixty years of age.

Sec. 4. Any member of the Society who shall make, vend, or publicly recommend, or who is directly or indirectly interested in the manufacture, use or sale of any nostrum or patent medicine, shall not be eligible to any office, and is liable to be suspended from the privileges of the Society, or to expulsion.

Sec. 5. No member of the Society shall hold professional consultation or intercourse with any other than Licensed Physicians and Surgeons in regular standing.

Sec. 6. It shall be the duty of each member of this Society, to notice any other members of the Society, for such misdemeanors as he deems contrary either to the By-Laws, Medical Police, or Rules and Regulations, adopted by the Society; and the censure shall proceed in the manner directed in Chapter IV, Sec. 6, of By-Laws.

Chapter VII.

Elections.

Sec. 1. All elections for Officers of the Society shall be at the Annual Convention, and by ballot; and a majority of votes shall be requisite to elect.

Sec. 2. Before the Society proceed to ballot, the Committee on Nominations shall present a list of candidates for the several offices provided for in Chap. II, Sec. 1, of these By-Laws; and, an opportunity having been given to the members to make other nominations, the Society shall then be called to ballot: if no election is obtained on the first canvass, the two highest shall be the candidates for the next balloting. When a choice is made, the persons chosen shall hold their office during one year, and until others shall be elected.

Sec. 3. The Nominating Committee shall report names for delegates to the American Medical Association, and to corresponding Societies, and shall also nominate a Committee of Arrangements, whose duty it shall be to provide convenient accommodations for the next Annual Convention, and an Anniversary Chairman, who shall preside at the dinner of the next year. The Anniversary Chairman shall be one of the Committee of Arrangements.

MISCELLANEOUS.

The Society adopts the Code of Ethics of the American Medical Association as a part of its Constitution and By-Laws.

No article of the By-Laws, as now adopted, shall be altered or amended, except the subject proposed shall have been submitted in writing to the consideration of the President and Fellows at a previous stated meeting; and a vote of two-thirds of the members present in that body, shall be necessary to ratify and confirm any amendment.

On the day of the Annual Convention, a dinner shall be provided, at the expense of the Society, under the direction of the Committee of Arrangements.

Every member of the Society, whose taxes are all paid, shall receive, on application to the Treasurer, a dinner ticket. And the Treasurer is hereby authorized

to receive the dues of any member who may be in arrears, and credit the same to his account with the Clerk of his County Association.

An invitation to the dinner may be given to such eminent persons as the President of the Society, or Anniversary Chairman, shall think proper to notice in this manner.

ORDER OF BUSINESS

At the Annual Meeting of the President and Fellows.

Organization.

Presentation of certificates to the Secretary, who, with two Fellows appointed by the President, shall examine the same, and the Secretary shall report the names of those approved, together with the names of the Officers, the Fellows present, and Delegates from corresponding Societies.

Minutes of last annual and special meetings read.

Unfinished business of previous year disposed of.

Committee on Nominations.

Reception and reference, without debate, of communications, resolves, &c., from the several Counties and members of the Convention.

Treasurer's Report.

Committee to audit the Treasurer's report.

Committee to nominate one or more Essayists for the next year, which Committee shall report at the Annual Convention.

Committee to nominate for vacancies in Standing Committees.

Reports of Committees appointed on County Communications, &c.

Reports of Standing Committees.

Reports of Committees in the order in which business was brought forward in the morning.

Miscellaneous business. Adjournment.

Order of Business in Annual Convention.

Organization.

List of New Members read by the Secretary.

The President's Address.

Written Reports, Essays, Reports of Delegates to and receptions of Delegates from other Societies, &c., in the order arranged by Business Committee.

Any propositions or suggestions, conducive to the welfare of the Society, or to the general interests of Medicine, may be brought forward by any member. The Society shall decide by vote whether to engage in the consideration of the same.

It will be in order at any time, if questions of interest are suggested by the debates in Convention, to appoint a special committee on the same, to report at the next Convention.

Communications offered by persons not members of the Society, shall be received by a majority vote of the Society.

Report of Committee to nominate Essayists for ensuing year.

Report of the Nominating Committee.

Election of Officers. Adjournment to dinner.

EDITORIAL NOTICES.

The Committee of Publication congratulate the Society in view of the steady improvement of our Transactions.

The condition of our Finances, under the management of the present able Treasurer, enables us to introduce Scientific illustrations of great value to the profession.

In view of these improvements the Committee would suggest to contributors the importance of GREAT CARE IN THE PREPARATION OF PAPERS INTENDED FOR PUBLICATION, as it sometimes causes unnecessary delay to allow the authors of papers to make corrections when the matter is in type.

The Committee would also call attention to the fact that the Secretary is *required* to prepare and circulate a Programme of the literary exercises before the meeting of the Convention. To allow the proper preparation of such a programme, all papers intended for publication should be sent to the Publishing Committee *before* the Tenth day of May. Reports of County Clerks should also be sent promptly to the Secretary, BEFORE THE FIRST OF MAY, as the By-Laws of the Society require.

As the next Convention is expected to take definite action on the proposed new Charter and By-Laws, this subject should receive prompt attention at all the County Meetings. See Appendix B.

The Proceedings are sent by mail to all members of the Society not in arrears for taxes; to all Honorary Members and to Delegates from other societies; to the Secretaries of other State Societies; to Editors of Medical Journals who desire them. Persons entitled to the Proceedings, who fail to receive them, are requested to send their names and Post Office address to the Secretary.

A few copies of the Prize Essays published last year are still on hand, and can be supplied at fifty cents per copy, on application to the Secretary.

N. B.—The Connecticut Medical Society are not responsible for the opinions advanced in any of the papers they publish, except where reports of Committees are approved by special vote.

The Secretary regrets the delay which has occurred in publishing the Proceedings this year. Those who know the amount of labor imposed upon the Secretary in getting out a volume of the character which we offer to the Society this year, will excuse this unavoidable delay.

M. C. WHITE,
Secretary of the Conn. Med. Society.

111 George Street, New Haven.

AMERICAN MEDICAL ASSOCIATION.

The American Medical Association is making great efforts to raise the standard of Medical Education, and improve the profession.

Every member of a Medical Association is benefitted, more or less, by these labors, and *should* aid the Association by taking its published Transactions. Any one who will remit by mail Five Dollars to the subscriber, shall receive by return mail a receipt, and when the volume is published, it shall be delivered, free of expense, in Hartford, New Haven, or Meriden, as directed.

B. H. CATLIN, M. D.

West Meriden, June, 1849.

P. S.—The volume for 1849 is ready for the printer, and will be issued as soon as the funds are provided.

PROCEEDINGS.

The *Seventy-Eighth* Convention of the Connecticut Medical Society was held at New Haven, May 25th and 26th, 1870.

The Convention assembled in the Common Council Chamber in the City Hall at 3 P. M., Wednesday, May 25th, and was called to order by the President, Henry Bronson, M.D. The list of Fellows, as reported by the Clerks of the several County Meetings, was read by the Secretary.

The President appointed Dr. Geo. A. Ward a Committee on Credentials, who reported that the printed list prepared and read by the Secretary was correct, and the report was accepted as follows, viz:—

NEW HAVEN COUNTY.

O. W. Peck, M.D.
C. A. Lindsley, M.D.
G. A. Ward, M.D.
R. F. Stillman, M.D.
Sheldon Beardsley, M.D.

HARTFORD COUNTY.

Melancthon Storrs, M.D.
*E. F. Parsons, M.D.
E. K. Hunt, M.D.
A. W. Barrows, M.D.
G. W. Sanford, M.D.

NEW LONDON COUNTY.

*Abiel W. Nelson, M.D.
Ashbel Woodward, M.D.
*A. B. Hallo, M.D.
Charles M. Carleton, M.D.
Albert T. Chapman, M.D.

FAIRFIELD COUNTY.

Wm. G. Brownson, M.D.
George B. Benton, M.D.
George L. Beers, M.D.
Andrew J. Smith, M.D.
*Aug. H. Abernethy, M.D.

* Absent.

LITCHFIELD COUNTY.

H. W. Bird, M.D.
*J. W. Bidwell, M.D.
B. B. North, M.D.
F. J. Young, M.D.
J. B. Derickson, M.D.

MIDDLESEX COUNTY.

George W. Burke, M.D.
Rufus Baker, M.D.
Denison H. Hubbard, M.D.

TOLLAND COUNTY.

G. H. Preston, M.D.
A. R. Goodrich, M.D.
O. B. Griggs, M.D.

WINDHAM COUNTY.

Samuel Hutchins, M.D.
Lewis Williams, M.D.
Elphalet Huntington, M.D.
L. F. Bugbee, M.D.
*Lowell Holbrook, M.D.

The following gentlemen were present as Delegates from other Societies, viz:

VERMONT MEDICAL SOCIETY.

Chas. A. Sperry, M.D.

MEDICAL SOCIETY OF THE STATE OF NEW YORK.

Seth Shove, M.D.,
Robert Newman, M.D.,
John P. Garrish, M.D.

MEDICAL SOCIETY OF NEW JERSEY.

Thomas Ryerson, M.D.†

On motion of Dr. C. A. Lindsley, the election of Officers was postponed to wait for the arrival of other Fellows by the next train.

The President appointed the following committees, viz:—

On Reception of Delegates from other Societies—S. G. Hubbard, M.D. and H. A. Carrington, M.D.

On Resolutions of County Meetings and from Fellows of the Convention—Drs. C. A. Lindsley, L. S. Wilcox, G. H. Preston.

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* Absent.

† Dr. Ryerson being unexpectedly detained at home, sent a pleasant fraternal letter which was read to the Convention.

The Votes of the several County Meetings on the Proposed New Charter and By-Laws; the dismissal of two members by New Haven County Meeting, and a Preamble and Resolutions offered by Dr. E. K. Hunt, were referred to this Committee without debate.

Committee to nominate Delegates to the American Medical Association and to other Societies—Drs. E. K. Hunt, Ashbel Woodward, and O. W. Peck.

Committee to Audit Treasurer's Report—Drs. A. W. Barnes and G. W. Burke.

Committee on Gratuitous Students—Lewis Williams, M. Storrs and A. H. Abernethy.

Committee on Honorary Degrees and Honorary Membership—Drs. E. K. Hunt, H. W. Buel and George L. Beers.

Committee to nominate Dissectors—Drs. C. A. Lindsley and F. J. Young.

On Committee of Publication—Drs. G. W. Russell and L. J. Sanford.

On Registration—Dr. Geo. L. Beers.

The Treasurer then read his Annual Report, which was accepted and referred to the Auditing Committee already appointed.

The President's Address was deferred until 8 P. M. by an understanding between the President and the Committee of Arrangements.

The Committee on County Resolves reported, recommending that the action of New Haven County Meeting be approved and that S. G. Bartlett, M.D., of Naugatuck, and Frank G. Tuttle, M.D. also of Naugatuck, be honorably dismissed from the Society. On motion, this report was adopted and the gentlemen named were honorably dismissed from the Society.

The Committee also reported the Preamble and Resolutions presented by E. K. Hunt, M.D., and recommended their adoption. On motion, they were adopted as follows, viz:

WHEREAS, it is now proved, beyond a reasonable doubt, that the late Dr. Horace Wells, of Hartford, is entitled to the distinguished honor of having demonstrated on the 11th of December, 1844, the great fact that the human system may be rendered insensible during surgical operations by the inhalation of nitrous oxyd gas: and

WHEREAS, he at once made known the discovery to the medical and dental profession in Hartford, and continued to perform operations himself and assist others in performing them, while the patients were under the influence of this substance, until his death in 1848; and

WHEREAS, it is also proved that he used to some extent the vapor of sulphuric ether for the same purpose as early as the winter of 1844-5; and

WHEREAS, during the same winter, and a short time after his discovery, he visited the cities of Boston and New York, and made known to several of the most distinguished members of the medical profession in those cities his use of both these agents, thereby exhibiting the most commendable desire to make known to the world the knowledge of his discovery; and

WHEREAS, these facts are proved to have occurred nearly two years prior to the claim of discovery by any other person or persons; *Therefore*

Resolved, That in the opinion of this society there can no longer exist a reasonable doubt that to Dr. Wells alone belongs the honor of having discovered and demonstrated the great principle of modern anæsthesia.

It was further

Resolved, That the President and Fellows of the State Medical Society, now in session, finding the accompanying Preamble and Resolutions which have just been read, and the latter passed with great unanimity at the recent meeting of the National Medical Association, correctly to express the deliberately formed opinion and judgment of this Body, as to the subject to which they refer, hereby cordially approve and endorse the same; and for the purpose of more fully showing its sense of the great value of the discovery therein named, and the just claim of the discoverer to the lasting gratitude of the medical profession and mankind, do appoint a Committee of three of our number whose duty it shall be immediately to take such measures as shall seem to it best, to secure the erection of a monument which shall fitly commemorate the great fact of the discovery and forever perpetuate the name and memory of its discoverer.

The President appointed Drs. H. P. Stearns, A. W. Barrows and S. G. Hubbard a Committee to present to the Legislature the views of the Convention in relation to the claims of Dr. Wells as the discoverer of anæsthesia.

Drs. Geo. A. Ward and O. W. Peck were appointed Tellers, and the Convention proceeded to the Election of Officers for the ensuing year as follows, viz:

President, CHARLES F. SUMNER, M.D.; *Vice President*, GURDON W. RUSSELL, M.D.; *Treasurer*, J. C. JACKSON, M.D.; *Secretary*, MOSES C. WHITE, M.D.

The newly elected President took the Chair.

The Delegates from other Societies were then introduced to the Convention by the appropriate Committee, viz: C. A. Sperry, M.D., from Vermont; Seth Shove, M.D., from New York; Robert Newman, M.D., from New York.

On motion, the President appointed the following gentlemen (one from each county) a Committee to Nominate persons to fill the vacancies in the Standing Committees, viz: Drs. C. A. Lindsley, W. G. Bronson, Ashbel Woodward, A. W. Barrows, H. W. Buel, D. H. Hubbard, A. R. Goodrich and E. Huntington.

The Committee on County Resolves reported the action of the several County Meetings on the Proposed New Charter and By-Laws, and recommended that the Charter and By-Laws be taken up section by section, and that, after allowing opportunity for discussion and amendments in Convention, they be submitted to vote by the Convention. The Report was accepted and with various amendments the Proposed Charter and By-Laws were adopted section by section, and afterwards they were adopted as a whole in the form given in *Appendix B.*

It was then voted that a Committee of five be appointed by the President to obtain from the Legislature a revision of the Charter of the Society in the form just approved by the Convention. The Committee appointed are—Drs. C. A. Lindsley, J. G. Beckwith, P. W. Ellsworth, A. R. Goodrich.

Dr. C. A. Lindsley, in behalf of the Prudential Committee of the General Hospital Society, invited the Convention to visit the Hospital at their convenience.

Adjourned to meet again at 8 P. M. to listen to the Address of the retiring President.

Evening Session.

At 8 P. M. the Convention reassembled and was called to order by the President, C. F. Sumner, M.D.

The retiring President, Henry Bronson, M.D., then delivered an able and interesting Address entitled "Science as a Helper; Inheritance as a Hindrance; Death as a Conservator."

On motion of Dr. J. G. Beckwith, the thanks of the Convention were tendered to Dr. Bronson for his address, and a copy was requested for publication in the Proceedings.

Adjourned to 8 A. M.

Thursday, May 28th.

The Convention reassembled at 8 A. M. and was called to order by the President, C. F. Sumner, M.D.

Reports of Standing Committees were called for. The Committee on Examinations for Degrees were authorized to present their report to the Committee of Publication. *See Appendix A.*

The Committee of Publication reported the titles of various papers approved for publication, and also reported the order of literary exercises for the day. The report was approved.

The Committee on Honorary Degrees and Honorary Membership proposed the name of Wm. S. Bowen, M.D., of Bridgeport, as a candidate for Honorary Membership. The nomination remains on file for one year, in accordance with the By-Laws of the Society.

The Committee on Gratuitous Students made their Report, which was approved and placed on file.

Voted, That the Annual Tax be Two Dollars, payable June 1st, 1870.

The Auditing Committee reported that the accounts of the Treasurer are found to be correct. The Treasurer's Report was then approved and placed on file.

The following abstract made up from the Treasurer's Report will show the financial condition of the Society.—Committee of Publication.

Abstract from Treasurer's Report.

May 27, 1869.	Cash in Treasury,	$265.24	
May 25, 1870.	Cash collected during the year,	391.74	
			$657.04
	Expenses for the year ending May 25, 1870		
	Printing Proposed Charter and By-Laws,	$21.75	
	Secretary's Bill Expenses and Programme of Convention,	11.41	
	Use of Allyn Hall, May, 1869,	10.00	
			$53.16
	Printing Proceedings for 1869,	$379.24	
	Wood Cuts do do	20.00	
	8 Pages Lithographic do	12.00	
	Postage on Proceedings do	23.64	
			$437.88
	Treasurer's Salary and Expenses,	12.50	
			$503.54
May 25, 1870.	Balance in Treasury,		$153.50

	Taxes Remaining Unpaid.	*Outstanding Debentures.*
Hartford County,	$ 32.00	$200.00
New Haven "	259.00	10.87½
New London "	244.00	8.75
Fairfield "	466.62	101.25
Windham "	62.00	9.50
Litchfield "	372.70½	45.25
Middlesex "	90.00	60.00
Tolland "	66.00	60.00
	$1613.32	$174.62½

General Summary.

Cash in Treasury,		$138.87½
Due from Clerks,	$619.94	
Deduct three-fourths of this for stationery, commissions, bad debts, &c.,	196.96	
		422.98
Leaves a Total of Cash and due from Clerks,		$561.85½
The Society owes, as stated, for Dobestanes outstanding,		$174.62½
Leaving a balance in favor of the Society,		$386.23
Balance last year,		612.41½
Decrease of Balance from last year,		$226.18½

The Secretary read a communication from Wm. B. Bibbins, M.D., of the American Medical Association, asking the appointment of a Committee to co-operate in the preparation of a National Register of Physicians and Surgeons in the United States.

On motion, the following gentlemen were appointed a Committee to co-operate with the Committee of the American Medical Association in the preparation of a U. S. Medical Register, viz: S. G. Hubbard of New Haven, G. B. Hawley of Hartford, C. M. Carleton of Norwich, Geo. L. Beers of Bridgeport, H. M. Knight of Lakeville, O. B. Griggs of Mansfield Centre, E. Huntington of Windham, D. H. Hubbard of Clinton.

On motion of the Secretary, it was

Resolved, That a Committee of three be appointed to inquire whether the Honorary Degree of Doctor of Medicine can legally be conferred by any corporation in this State without the recommendation of the Connecticut Medical Society. The President appointed as said Committee, Drs. G. W. Russell of Hartford, Lewis Williams of Pomfret, and Rufus Baker of Middletown.

The Committee on Nominations reported and the following were elected to fill vacancies on the standing committees, viz:—

On Committee of Examination—Rufus Baker, M.D., Lowel Holbrook, M.D., F. L. Dickinson, M.D.

On Committee to Nominate Professors in Yale College—David L. Daggett, M.D., H. W. Bird, M.D.

On Committee to Nominate Physicians to the Retreat for the Insane—P. M. Hastings, M.D., Gideon L. Platt, M.D.

Dr. C. A. Lindsley presented a Design for an Obituary Tablet to be printed in the Proceedings, with the Obituary Record for the

year inclosed. On motion, the design was approved by the Convention, and Drs. C. A. Lindsley, M. C. White and J. C. Jackson were appointed a committe to secure its publication in the Proceedings.

On motion of the Secretary, Drs. Henry Bronson, J. G. Beckwith and G. H. Preston were appointed a Committee to revise and continue the List of Fellows and other Officers of the Society from its origin to the present time, and prepare the same for publication in the Proceedings for 1871.

The Nominating Committee reported, and Francis Bacon, M.D., was chosen *Dissector*, and H. M. Knight, M.D., *Alternate*.

The Committee appointed to nominate Delegates to the Am. Med. Association, &c., made their report, which was adopted as follows, viz:—

Delegates to *Am. Medical Association*—J. W. Phelps, M.D., of Wolcottville; Ashbel Woodward, M.D., of Franklin; E. K. Hunt, M.D., of Hartford; H. W. E. Matthews, M.D., of New Haven; Andrew J. Smith, M.D., of Bridgeport.

Delegates to *Maine Medical Association*—John Witter, M.D., of Woodstock; Rufus Baker, M.D., of Middletown.

Delegates to *New Hampshire Medical Society*—J. C. Jackson, M.D., of Hartford; John H. Simmons, M.D., of Ashford.

Delegates to *Vermont Medical Society*—S. L. Childs, M.D., of East Hartford; L. F. Bagloe, M.D., of Willimantic.

Delegates to *Mass. Medical Society*—Isaac G. Porter, M.D., of New London; George W. Burke, M.D., of Middletown.

Delegates to *Rhode Island Medical Society*—G. H. Preston, M.D., of Tolland; O. B. Griggs, M.D., of Mansfield Centre.

Delegates to *New York Medical Society*—H. W. Bael, M.D., of Litchfield; J. M. Ainse, M.D., of West Haven; Geo. B. Bonton, M.D., of Westport; W. A. M. Wainwright, M.D., of Hartford; C. A. Lindsley, M.D., of New Haven.

Delegates to *New Jersey Medical Society*—O. W. Peck, M.D., of New Haven; P. M. Hastings, M.D., of Hartford.

Delegates to *Pennsylvania Medical Society*—F. Bacon, M.D., of New Haven; D. H. Hubbard, M.D., of Clinton.

Voted, That Delegates to the American Medical Association, and to other Societies, have power to appoint substitutes, who may apply to the Secretary for credentials.

Honorary members were elected as follows, viz:—H. I. Bowditch, M.D., of Boston; Seth Shove, M.D., of Katarah, N. Y.; Samuel T. Hubbard, M.D., of New York City.

It was *Voted*, That the name of Nathaniel Drake Haight be recommended to the President of Yale College as a suitable candidate for the Honorary Degree of Doctor of Medicine.

10 A. M. The hour for literary exercises having arrived, L. S. Wilcox, M.D., read the Annual Dissertation, entitled "The external use of Oil in the treatment of Disease."

Dr. S. G. Hubbard of New Haven read a paper entitled "Specialists in its Relations to Practical Medicine." This paper was referred to the Committee of Publication.

It was then *Voted*, to publish 350 copies of the Proceedings.

Dr. J. P. Garrish, delegate from the Medical Society of the State of New York was introduced, and addressed the Convention.

The credentials of Dr. Ryerson, delegate from New Jersey, were read; also a letter from Dr. Ryerson was read to the Convention.

Dr. Geo L. Beers then read a paper prepared by Dr. Gustave Ohnesorg, of Bridgeport, giving some account of the peculiar symptoms manifested in several cases of trichinosis which came under his care in February and March last.

A recess was then taken for 20 minutes, during which time trichinæ and other objects were exhibited to the members of the Convention by means of six Compound Achromatic Microscopes. This exhibition was conducted by Prof. M. C. White, assisted by W. L. Bradley, M.D., and formed a *pleasing and intensely interesting episode* in the proceedings of the Convention.

When the Convention was again called to order, R. Newman, M.D., of New York, Delegate from the N. Y. State Medical Society, read a paper on the Use of the Endoscope in the Treatment of Urethritis. The Endoscope and accessory apparatus were exhibited to the Convention. The thanks of the Convention were tendered to Dr. Newman for the interesting exhibition and paper on the Endoscope.

Dr. H. A. Carrington, of New Haven, read a paper entitled "Heredity," which was referred to the Committee of Publication.

Dr. Garrish made a verbal communication on Pelvic Deformities and the Induction of Premature Labor in cases of contracted pelvis, to save the life of mother and child. About the end of the seventh month Dr. G. administers extract of belladonna, ¼ of a grain three times a day, until its specific effects are produced,

commencing ten or twelve days before attempting to induce labor. He uses the hot douche per vagina, until faintness is induced, and in ten or twelve hours labor commences. He has treated fifteen cases of deformed pelvis by this method, with success.

Dr. Geo. F. Lewis, of Bridgeport, exhibited an improved bivalve uterine speculum of his own invention.

Voted, That the Committee of Publication be authorized to make verbal alterations in the new code of By-Laws without altering the sense.

Henry Bronson, M.D., read an interesting biographical sketch of the late Prof. Worthington Hooker, M.D.

In view of the changes required by the adoption of new By-Laws and the anticipated revision of the Charter by the Legislature, the Nominating Committee proposed the following committees, which were elected, viz:—

Committee on Matters of Professional Interest to the State—E. E. Hunt, M.D., B. H. Catlin, M.D. and H. A. Carrington, M.D.

Committee of Arrangements for next Convention—M. Storrs, M.D., A. W. Barrows, M.D. and Wm. M. Hudson, M.D.

Voted, That the Thanks of the Convention be tendered to the Common Council of New Haven for the use of their Council Chamber for the meetings of the Convention.

Adjourned to meet in Hartford at 3 P. M., the fourth Wednesday in May, A. D. 1871.

By invitation of the New Haven Medical Association, the members of the Convention and invited guests then partook of a sumptuous entertainment at the New Haven House.

Attest,

MOSES C. WHITE, *Secretary*.

111 George st., New Haven, Conn.

OFFICERS OF THE SOCIETY,

FOR 1870--71.

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CHARLES F. SUMNER, M.D., of Bolton.

VICE-PRESIDENT,
GURDON W. RUSSELL, M.D., of Hartford.

VICE-PRESIDENTS, *Ex-officio*.
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ALVAN TALCOTT, M.D., of Guilford.
ISAAC G. PORTER, M.D., of New London.
S. S. NOYES, M.D., of New Canaan.
SAMUEL HOLBROOK, M.D., of Thompson.
H. W. BUEL, M.D., of Litchfield.
DENISON H. HUBBARD, M.D., of Clinton.
A. B. GOODRICH, M.D., of Vernon Depot.

TREASURER,
JAMES C. JACKSON, M.D., of Hartford.

SECRETARY,
MOSES C. WHITE, M.D., of New Haven.

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H. W. E. MATTHEWS, M.D.
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LUCIAN S. WILCOX, M.D.
RUFUS BAKER, M.D.
LOWEL HOLBROOK, M.D.
F. L. DICKINSON, M.D.

Committee to Nominate Professors in the Medical Institution of Yale College.

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ROBERT HUBBARD, M.D.
STEPHEN G. RISLEY, M.D.
DAVID L. DAGGETT, M.D.
H. W. BUEL, M.D.

Committee to Nominate Physician to the Retreat for the Insane.

ISAAC G. PORTER, M.D.
SAMUEL HUTCHINS, M.D.
H. M. KNIGHT, M.D.
P. M. HASTINGS, M.D.
G. L. PLATT, M.D.

Committee of Publication.

MOSES C. WHITE, M.D., *Ex-officio.*
HENRY BRONSON, M.D.
ALVAN TALCOTT, M.D.
G. W. RUSSELL, M.D.
L. J. SANFORD, M.D.

Committee on Matters of Professional Interest in the State.

E. K. HUNT, M.D.
B. H. CATLIN, M.D.
H. A. CARRINGTON, M.D.

Committee of Arrangements.

M. STORRS, M.D.
A. W. BARROWS, M.D.
WM. M. HUDSON, M.D.

Committee on Registration.

S. G. HUBBARD, M.D.
IRVING W. LYON, M.D.
GEO. L. BEERS, M.D.

Dissertator—FRANCIS BACON, M.D.
Alternate—HENRY M. KNIGHT, M.D.

MEMBERS OF THE SOCIETY.

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*WRIGHT POST,	New York City.
*BENJAMIN SILLIMAN,	New Haven.
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*CHARLES ELDREDGE,	East Greenwich, R. I.
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*GEORGE FROST,	Springfield, Mass.
WILLARD PARKER,	New York City.
*ENAJAH TICKNOR,	U. S. Navy.
ALDEN MARCH,	Albany, N. Y.
*AMOS TWITCHELL,	Keene, N. H.
CHARLES A. LEE,	New York City.

* Deceased.

*DAVID S. C. H. SMITH,	Providence, R. I.
*JAMES M. SMITH,	Springfield, Mass.
HENRY D. SULKLEY,	New York City.
J. MARION SIMS,	New York City.
*JOHN WATSON,	New York City.
FRANK H. HAMILTON,	Brooklyn, L. I.
*ROBERT WATTS,	New York City.
J. V. C. SMITH,	New York City.
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JOHN G. ADAMS,	New York City.
JARED LINSLEY,	New York City.
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ARTHUR WARD,	Belleville, N. J.
HIRAM CORLISS,	Washington, N. Y.
E. E. WEBSTER,	Boscawen, N. H.
P. A. STACKPOLE,	Dover, N. H.
S. P. S. SIMPSON,	Concord, N. H.
A. T. WOODWARD,	Vt.
WM. McCULLOM,	Vt.
J. C. HUTCHINSON,	Brooklyn, N. Y.
BENJ. F. COTTING,	Boston, Mass.
HENRY I. BOWDITCH,	Boston, Mass.
SETH SHOVE,	Keeseville, N. Y.
SAMUEL T. HUBBARD,	New York City.

PHYSICIANS FOR HONORARY MEMBERSHIP.

WM. S. BOWEN, M.D.,	Bridgeport.

* Deceased.

ORDINARY MEMBERS.

The names of those who have been Presidents are in Capitals.

HARTFORD COUNTY.

G. A. MOODY, M.D., of Unionville, President.

H. S. PELLER, M.D., of Hartford, Clerk.

HARTFORD, Henry Holmes, S. B. BEDFORD, G. B. Hawley, G. W. Russell, David Crary, P. W. Ellsworth, E. E. HUNT, J. S. Butler,* J. C. Jackson, A. W. Burrows, Thomas Miner,* William Porter, John F. Wells, William H. Brownell, F. M. Hastings, Edward Bulkley, W. H. Tremaine, Lucian S. Wilcox, Henry P. Stevens, S. C. Freeman, Irving W. Lyon, Daniel Pell, Mc-Lauthon Storrs, Horace S. Fuller, John O'Flaherty, Nathan Mayer, Wm. M. Hudson, George C. Jarvis, Marvin W. Easton, W. A. M. Wainwright, E. M. Dunbar, David Crary, Jr., George P. Hawley, J. B. Lewis, E. G. Bromley.

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BLOOMFIELD, Henry Gray.

BRIDGEWATER, E. E. Leonard.

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MANCHESTER, William Scott.*

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ROCKY HILL, H. W. Griswold.

SIMSBURY, Tariffville, G. W. Stafford.*

Weatogue, E. A. White.

SOUTHINGTON, Julius S. Barnes,* N. B. Byington.* F. A. Hart.

STEPNEY, Anson Rising,* J. K. Mason.

WEST GRANBY, James D. Wilcox.*

WEST HARTFORD, Edward Bunce.*

WETHERSFIELD, S. P. Cook,* A. S. Warner.

WINDSOR, A. Morrison, S. A. Wilcox.

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* Over sixty years of age.

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EDWARD DORRIE, M.D., of New Haven, Clerk.

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WESTVILLE, J. W. Barker.

BRANFORD, H. V. C. Holcomb, Newton B. Hall.

GUILFORD, A. J. Driggs, M. N. Chamberlin.

DERBY, Charles H. Pinney.

BIRMINGHAM, Ambrose Beardsley.

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NORTH BRANFORD, Sheldon Beardsley.*

NORTH HAVEN, R. F. Stillman.

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WATERBURY, G. L. Platt, John Deacon, George E. Perkins, Philo G. Rockwell, Thos. Dougherty, Alfred North, Edward L. Griggs.

Woodbridge, David M. Elwood.

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COLCHESTER, Ezekiel W. Parsons,* Frederick Morgan.*

FRANKLIN, ASHBEL WOODWARD.

GREENVILLE, Wm. White.

GROTON, Mystic River, A. W. Coates, John Gray.

LEBANON, Ralph Green.*

MYSTIC, Mason Manning,* Albert T. Chapman.

NORWICH, Richard P. Tracy,* Elijah Dyer,* Elisha Phinney,* A. S. Hale, Lewis S. Paddock, Chas. M. Carleton, P. S. Abbott, Wm. S. C. Perkins.

OLD LYME, Richard Noyes,* Geo. W. Harris.

STONINGTON, William Hyde.*

Mystic Bridge, E. Frank Coates.

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* Over sixty years of age.

FAIRFIELD COUNTY.

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GILBERT L. BURR, M.D., of Bridgeport, Clerk.

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Southport, Justus Sherwood.*
BETHEL, William H. Mather.
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South Norwalk, M. R. Parsloe, R. L. Higgins.
REDDING, O. S. Hubbell.
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North Stamford, Geo. W. Birch.
STRATFORD, Roger M. Gray.
TRUMBULL, George Dyer.*
WESTPORT, George Blackman,* George S. Rodgers.
WILTON, A. E. Keeler.
HUNTINGTON, Gould A. Shelton.

WINDHAM COUNTY.

LOWEL HOLBROOK, M.D., of Thompson, President.

SAMUEL HOWARTH, M.D., of West Killingly, Clerk.

WINDHAM, E. Huntington.
ASHFORD, John H. Simmons.
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HAMPTON, Dyer Hughes.*
KILLINGLY, Justin Hammond.*
South Killingly, Daniel A. Wing.*
West Killingly, Samuel Hutchins.
East Killingly, Edwin A. Hill.
PLAINFIELD, Wm. M. CORDWELL.*
POMFRET, Hiram Hall,* Lewis Williams.
PUTNAM, H. W. Hough,* Daniel S. Plympton.
SCOTLAND, Calvin B. Beasley.*
PLAINFIELD, Murray, Wm. A. Lewis, Chas. H. Rogers.
THOMPSON, Lowell Holbrook, Charles Hosford.
TORRINGTON, Harvey Campbell.*
WESTFORD, Putnam G. Bennett.
WOODSTOCK, Lorenzo Morey.*
East Woodstock, John Witter.
South Woodstock, A. S. Leonard.
West Woodstock, Milton Bradford.*
WILLIMANTIC, Willimantic, Fred. Rogers, T. Morton Ellis, L. F. Hughes.
Windham Center, H. E. Babcock.

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* Over sixty years of age.

LITCHFIELD COUNTY.

H. W. BUEL, M.D., of Litchfield, President.

J. W. EDWARDS, M.D., of West Winsted, Vice President.

H. R. GAYLORD, M.D., of Litchfield, Clerk.

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SHARON, Everton, Francis J. Young.
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WARREN, Gurdy H. Minor.*
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WARREN, John B. Dutcheon.
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WINCHESTER, West Winsted, James Welch,* John W. Bidwell.
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TERRYVILLE, Cornelius W. Bill.†

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MOSES C. HAZEN, M.D., of Haddam, Clerk.

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HADDAM, Miner C. Hazen.
CHATHAM, Middle Haddam, Albert B. Worthington.
KILLINGWORTH, G. P. Reynolds.
CHESTER, Sylvester W. Turner.
OLD SAYBROOK, Asa H. King,* J. H. Greene.
CLINTON, Denison H. Hubbard.*
PORTLAND, George O. Jarvis,* C. A. Sears.
CROMWELL, Ira Hutchinson.*
SAYBROOK, Deep River, Edwin Ednell.*

TOLLAND COUNTY.

A. R. GOODRICH, M.D., of Vernon Depot, President.

GILBERT H. PARSONS, M.D., of Tolland, Clerk.

TOLLAND, Oliver K. Isham,* G. H. Preston.
BOLTON, CHAS. F. SUMNER.
COVENTRY, Maurice B. Bennett.
South Coventry, Timothy Dimock,* Henry S. Dean.
ELLINGTON, J. A. Warren.
HEBRON, W. L. M. Brown.
MANSFIELD, Wm. H. Richardson.*
Mansfield Center, O. B. Griggs.
Mansfield Depot, Norman Brigham,* Julius N. Parker.
SOMERS, Orson Wood.*
STAFFORD, Wm. N. Clark.*
West Stafford, Joshua Hodgett.*
Stafford Springs, C. B. Newton.
Vernon Depot, A. R. Goodrich.
Rockville, Stephen G. Risley, Francis L. Hutchinson, N. Gregory Hall.

* Over sixty years of age. † Admitted June 13, 1876

APPENDIX A.

The Committee of Examination would respectfully report that they met at the Medical College for the Commencement Examinations, July 2, 1868. There were present, representing the Society, Charles F. Sumner, M.D., of Bolton; Dennison H. Hubbard, M.D., of Clinton; Henry W. E. Matthews, M.D., of New Haven; Ashbel Woodward, M.D., of Franklin, and Lucien S. Wilcox, M.D., of Hartford—and representing the Faculty of the College, Professors Silliman, Hubbard, Lindsley, White, Ives, Bacon, Sanford and Barker. Dr. Sumner, Vice-President of the Society acted as Chairman of the Board. Dr. Wilcox was appointed to report the proceedings of the Board to the Society.

Dr. Henry A. Carrington was appointed to address the graduates in 1870, and Dr. Henry M. Knight, alternate.

Four candidates for Degrees were examined. Two were recommended—Mr. George E. Fareman, of New Haven; Thesis—Anæsthesis, with a mention of several Anæsthetics—and Mr. John Frederick Barnett, of West Haven; Thesis—General remarks on Cancer, and that variety of it known as Scirrhus.

The Committee met again at the Medical College for the Annual Examination, Jan. 13, 1870. Representing the Society were Henry Bronson, M.D., of New Haven, Ex-officio, President; Dennison H. Hubbard, M.D., of Clinton; Lewis Williams, M.D., of Pomfret; Henry W. E. Matthews, M.D., of New Haven; Charles F. Sumner, M.D., of Bolton; Ashbel Woodward, M.D., of Franklin, and Lucien S. Wilcox, M.D., of Hartford—and representing the Faculty, Professors Silliman, Hubbard, Lindsley, White, Sanford, Bacon, Ives and Barker.

Two candidates sustained satisfactory examinations and were recommended for Degrees—Mr. Willis George Allyn, of New Haven; Thesis—General Reflections on Chronic Disease—and Mr. Frank Edwin Castle, of Westville; Thesis—Diphtheria.

The public exercises usual for the evening were omitted. The appointments were continued another year.

Respectfully submitted,

L. S. WILCOX, *Secretary.*

May 25, 1870.

APPENDIX B.

CHARTER AND BY-LAWS

OF THE

CONNECTICUT MEDICAL SOCIETY

CHARTER.

GENERAL ASSEMBLY, MAY SESSION, 1870, Amending the Charter of the Connecticut Medical Society.

Resolved by this Assembly:

SEC. 1. That the Physicians and Surgeons now members of the Connecticut Medical Society, and all Physicians and Surgeons who shall be associated with them in pursuance of the provisions of this act, shall be and remain a body politic and corporate, by the name of THE CONNECTICUT MEDICAL SOCIETY; and by that name they and their successors shall and may have perpetual succession; shall be capable of suing and being sued, pleading and being impleaded, in all suits of whatever name and nature; may have a common seal, and may alter the same at pleasure; and may also purchase, receive, hold and convey any estate, real or personal, to an amount not exceeding one hundred thousand dollars.

SEC. 2. That the superintendence and management of the Society shall be vested in a body to be known and called by the name of "The President and Fellows of the Connecticut Medical Society;" which body shall have power to prescribe the duties of its officers and members, and fix their compensation; to establish the conditions of admission, dismission and expulsion; to lay a

tax from time to time upon the members, not exceeding five dollars in each year; to collect the same, and to hold and dispose of all moneys or other property belonging to the Society in such manner as they may think proper to promote the objects and interests of the Society; and in general, to make such by-laws and regulations for the due government of the Society, not repugnant to the laws of the United States or of this State, as may be deemed necessary.

Sec. 3. That the President and Fellows of the Connecticut Medical Society shall be composed of the officers of the Society for the time being, and of Fellows, (not less than three nor more than five) chosen by and from each of the County Associations.

Sec. 4. That hereafter no one shall be admitted to membership, in any County Association having connection with this Society, unless he shall have received the degree of Doctor of Medicine, or have been admitted *ad eundem*, from such medical authorities as this Society shall deem proper to recognize.

Sec. 5. It shall be the duty of the several clerks of the County Associations, in their respective counties, to collect and pay over to the Treasurer of the Society all such taxes as shall from time to time be laid by the President and Fellows, upon the members of the Society as aforesaid; and for that purpose said clerks may procure a warrant under the hand of a justice of the peace, against such member or members of the Society as shall neglect or refuse to pay the taxes so imposed upon them as aforesaid; which warrant any justice of the peace is hereby empowered to issue, and said warrant shall be directed to the sheriff or his deputies of the county in which such delinquent member or members reside; and said sheriff or either of his deputies, on receiving such warrant, may therewith proceed to enforce the collection of such tax or taxes, in the same manner, and with the addition of the same fees, as are by law prescribed and allowed to the collectors of town taxes. And if any of the clerks of the County Associations shall neglect or refuse to collect the taxes entrusted to him to collect, by the time the same are made payable, or having collected the same, shall neglect or refuse to pay the same over to the Treasurer of the Society, such Treasurer may cause a suit or suits to be instituted against such delinquent, in the name of the Society, before any court proper to try the same, and the same to pursue to final judgment; and the clerks shall be allowed and receive a compensation of five per centum on all moneys collected by them respectively, and paid to the Treasurer of the Medical Society.

SEC. 6. That these amendments shall take effect on the day of its passage; and so much of the Act entitled an Act to incorporate the Connecticut Medical Society, approved June 5, 1834, and all such acts in addition thereto and amendations thereof as are inconsistent herewith, be, and the same are hereby repealed.—*Approved July 8th*, 1870.

State of Connecticut, ss.

OFFICE OF SECRETARY OF STATE.

I hereby certify that the foregoing is a true copy of record in this office.

In Testimony whereof, *I have hereunto set my hand, and affixed the Seal of said State, at Hartford, this 29th day of July, A. D. 1870.*

L. S.

Thos. M. Waller, Secretary of State.

BY-LAWS.

Chapter I.

Title and Meetings.

Section 1. This Society shall be known by the name of The Connecticut Medical Society; and it shall be composed of the members of the County Associations and of Honorary Members.

Sec. 2. The Connecticut Medical Society shall hold an Annual Convention on the Thursday following the fourth Wednesday in May. The Annual Convention shall assemble alternately at New Haven and Hartford. Ten members shall constitute a quorum. If the President and Vice President be absent, the Society may choose a President pro tempore.

Sec. 3. The President and Fellows of the Connecticut Medical Society shall hold an Annual Meeting.

Sec. 4. The County Associations shall hold in their respective counties an annual meeting.

Chapter II.

Officers.

Section 1. The officers of the Society shall consist of a President, Vice President, Treasurer, Secretary, Committee on matters of professional interest in the State, and the Presidents of the County Associations, who shall be Vice Presidents ex-officio.

Sec. 2. It shall be the duty of the President to preside at the Annual Convention, and at all the meetings of the President and Fellows, preserve order, state and put questions, call for reports of Committees, enforce the observance of the by-laws, and perform such other duties appropriate to his office, as the Society shall assign him. At the annual meeting of the President and Fellows, the President shall present such matters for their consideration as he may think require attention. At the Annual Convention he shall deliver an address on some suitable subject.

Sec. 3. In the absence or disability of the President, the Vice President shall preside, and in case of a vacancy in the office of President, caused by death, resignation or removal, all the duties pertaining to it shall devolve on the Vice President.

Sec. 4. It shall be the duty of the Treasurer to take charge and keep a correct account of all moneys belonging to the Society, together with the receipts and disbursements, and render annually to the President and Fellows a statement of

all moneys received and paid by him. He shall preserve, for the benefit of the Society, all donations and other moveable property committed to his charge, and keep an exact list of the same, together with the names of the respective donors. He shall not pay any money out of the treasury, nor make any investment of the funds of the Society, or change the same, but by order of the President and Secretary. And he shall deliver to his successor all books and papers, with the balance of cash or other property of the Society in his hands.

SEC. 5. The Secretary shall have charge of the records of the Society, attend all the meetings of the President and Fellows, and the annual Convention of the Society, record all the transactions of the same, give true copies of them, when thereto requested, conduct their correspondence, and have the custody of the seal of the Society. The Secretary shall be *ex-officio* chairman of the Committee of Publication.

The Secretary shall cause a notice to be put up each year in at least three Hotels in the town in which the Annual Convention meets, stating the time and place of meeting, at least one day before said meeting.

The Secretary shall send each year an extra copy of the published "Proceedings" of the Society, to each of the Clerks, for the use of the County Associations; also to other State Societies and to Honorary Members.

SEC. 6. The "Committee on matters of Professional Interest in the State" shall consist of three, and be considered members *ex-officio* of "the President and Fellows of the Connecticut Medical Society," to be elected annually by ballot, the first named to be Chairman, whose duty it shall be, at every Annual Convention, to report the progress of our sciences, particularly in Connecticut—remarkable and instructive cases of disease, that may have come to their knowledge—interesting facts or discoveries relating to medicine—all circumstances connected with epidemics (if any have prevailed,) and the treatment adopted, whether successful or otherwise—in short, whatever influences may concern the health of the citizens of Connecticut. And the more effectually to perfect this report, it shall be the duty of each County and other Association represented in this Society, annually to appoint one of its members as a Reporter, who shall furnish to this Committee, on or before the first day of May, all the information he can get relative to these subjects, within the limits of the district in which the local society exists.

SEC. 7. Any officer of the Society may, for sufficient reasons, resign his office, or may be removed therefrom by order of the President and Fellows, for neglect, inattention or mal-conduct, in either of which cases, or in the death of any officer, the President and Fellows shall supply the office vacated as soon as may be convenient.

SEC. 8. The necessary expenses of the Treasurer, Secretary, and Chairman of the "Committee on matters of professional interest in the State," shall be paid.

CHAPTER III.

President and Fellows of the Connecticut Medical Society.

SECTION 1. There shall be an annual meeting of the President and Fellows of the Connecticut Medical Society, on the day preceding the Annual Convention of the Society, and in the same city where the Convention is to be held.

Sec. 2. The President, Vice President, and eighteen Vice Presidents, Treasurer, Secretary, Committee on matters of Professional interest, and Fellows, shall be known and called by the name of the President and Fellows of the Connecticut Medical Society; a majority of whom legally assembled together shall be a quorum for the transaction of any business; and shall have power to make by-laws for the regulation and government of the Society, and for the promotion of the objects of the same, not repugnant to the laws of the United States or of this State; to expel any member of the Society for misconduct; to make rules for the admission of members of the Society, and for their dismission from the same; to lay a tax upon each member of the Society, not exceeding five dollars in each year; to dispose of the moneys thus raised, and all other property of the Society in such manner as they may think proper to promote the objects and interests of the Society.

The President and Fellows at any annual meeting and after one year's nomination of every candidate, and not otherwise, may, by a majority vote of those present, elect eminent physicians not resident within this State, to be honorary members of the Society. But those elected shall not exceed three in number in any year.

Sec. 3. At all the meetings of the Fellows for the transaction of business, the President of the Society, or in case of his absence, the Vice President shall preside; and in case of the absence of the President and Vice President, the Fellows present may elect one of their own number as President for the occasion.

Sec. 4. The President of the Society, or in case of his death, or inability, the Vice President, on any special occasion, shall have power to call a meeting of the Fellows and Fellows, at such time and place as he may think proper, when applied to by any five Fellows, two of whom shall be members of different County Societies, and he shall cause notice thereof to be given by the Secretary to each member of the time and place of meeting, which notice shall be mailed at least one week previous to said meeting; and the President shall also cause twenty days' notice of the special meeting to be given in two newspapers printed in this State.

Sec. 5. The Committee of Examination, the Committee to nominate Professors in the Medical Institution, and the Committee to nominate the Physician to the Retreat for the Insane, shall be chosen by ballot. Only two persons shall be elected on each of these Standing Committees each year, the first two on the list to be dropped, and the two chosen to be placed at the bottom; but any person may be re-elected. These Standing Committees of the Society shall report annually to the President and Fellows, whenever they have had occasion to act in their official capacity.

The Committee of Publication shall be three in number, of which the Secretary shall be one, and the others shall be chosen by ballot.

The Nominating Committee shall consist of one from every County Association represented; and the Fellows of each of said Associations respectively, shall choose from among themselves one to represent them on said Committee. This Committee shall report at the time appointed for the election.

All other Committees shall be appointed by the presiding officer.

Sec. 6. It shall be the duty of the Fellows of the several counties to present to the Annual Convention short obituary sketches of deceased members, which shall be revised, amended or condensed by the Committee of Publication, as they deem expedient.

SEC. 1. The President shall at an early hour of the session appoint a Committee of three Fellows, of which the Secretary shall be one, to be called the Business Committee, to whom all reports of cases, dissertations or other papers designed to be read at the Annual Convention shall be handed. And this Committee shall examine them and recommend the manner and order in which they shall be presented to the Convention.

CHAPTER IV.

County Associations.

SEC. 1. The members of the Connecticut Medical Society shall meet annually in their respective counties, and at such other times and places as have been or may hereafter be agreed upon by them; provided the annual meeting shall be at least four weeks before the fourth Wednesday in May. Each County Association shall be known and called by the name of the County in which it exists, and shall choose from among themselves a President, Clerk, and such other officers as may be found necessary. At their annual meeting, they shall elect by ballot, of their own number, in each county, five, except in the counties of Middlesex and Tolland, and in each of those counties, three Fellows, to have part in the superintendence and management of the Society.

SEC. 2. The County Associations in their respective counties, shall have power to adjourn meetings and to call special meetings, from time to time, as they shall deem expedient; and they may adopt such by-laws and regulations for their own government and for the promotion of Medical Science, as they may think proper, not contrary to the laws of the State or the by-laws of the Connecticut Medical Society.

SEC. 3. Any person of good moral character, found to possess the qualifications prescribed by the Charter and By-Laws of this Society, may, by any County Association, at any meeting legally holden, be admitted to membership, by a majority vote of the members present, by ballot, provided he is residing and practicing in said county, and makes application for that purpose.

SEC. 4. All persons so elected, shall, within one year after such election, subscribe the By-laws of the Society, or otherwise declare in writing their assent to the same, or such election shall be void.

SEC. 5. Any County Association may, by a majority vote, dismiss from the Society any member who shall remove from this State, or who shall leave the profession for other pursuits.

SEC. 6. Any County Association may, if it is deemed expedient, recommend to the President and Fellows, for dismission from the Society, any member residing in that county, who shall apply for such dismission by a written request to that effect delivered to the Clerk of said County Association at least ten days before the time of holding any legal County meeting; and also any member who shall refuse or neglect to pay taxes; and upon the approval of such recommendation by the President and Fellows, in annual meeting, the connection between such member and the Society shall be dissolved. *Provided*, That no member shall be honorably dismissed from the Society, until all his taxes shall have been paid.

SEC. 7. All violations of the By-Laws of the Connecticut Medical Society, or of the Medical Police adopted by the Society, or of the Rules and Regulations passed

by the County Association, in conformity with the By-Laws of the State Society, may be prosecuted and tried in the respective County Associations, under the following regulations, viz:—The member accusing another of a violation of any of the before-mentioned regulations, shall make a statement, in writing, of the transaction which he deems a misdemeanor, and lay the same before a Fellow of the Society; and such Fellow shall issue a notification to the accused, to appear before the next County Meeting, stating the time when and the place where it is to be held, to defend, if he see fit, against such accusation. A copy of such accusation and notification shall be left with the accused, or at his last usual place of abode, at least twelve days previous to the time of holding the next County Meeting. And the accuser shall cause the said accusation and notification to be served and returned to the Clerk of the County Association, on, or before the day of their sitting; and the offender, upon conviction, may be punished by admonition, by suspension from the privileges of the Society for a period not exceeding two years, or by expulsion from the Society. *Provided*, That no sentence of expulsion shall be valid, until confirmed by the President and Fellows, in Annual Meeting.

Sec. 8. When a new Clerk is chosen to any of the County Associations, his predecessor shall deliver over to him all the records and papers appertaining to the office, retaining copies of the same, if he think proper.

Sec. 9. It shall be the duty of the several Clerks of the County Associations, in their respective Counties, to collect and pay over to the Treasurer of the State Society, all such taxes as shall from time to time be laid by the President and Fellows upon the members of the Connecticut Medical Society. And the Clerks shall be allowed a compensation of five per cent. on all moneys collected by them respectively and paid to the Treasurer of the State Society. Provided such additional sum as the County Association may direct, not exceeding five per cent of the moneys collected, may be retained by the Clerk to pay the expenses of the meetings of said Association.

If any members neglect or refuse to pay the taxes legally imposed upon them, it shall be the duty of the Clerks of the County Associations to which they belong, to proceed against such delinquent members, according to law, in the collection of the same. And if any of the Clerks of the County Associations shall neglect or refuse to collect the taxes entrusted to him to collect, by the time the same are due; or having collected the same, shall neglect or refuse to pay the same over to the Treasurer of the State Society, such Treasurer may cause suit to be instituted against such delinquent, in the name of the Society, before any Court proper to try the same, and the same pursue to final judgment. The expenses incurred by the Clerks of the County Associations in collecting taxes, shall be canceled and paid by the Treasurer.

Sec. 10. The Clerks shall transmit the names and places of residence of the Fellows, and of the persons recommended for a gratuitous course of lectures, to the Secretary, before the first day of May in each year, that the Secretary may have ample time to arrange the programme for the Annual Convention. They shall also forward to the Secretary, and a duplicate copy to the Treasurer, on or before the annual meeting, the names of the members in their respective County Associations, and their place of residence; and those who fail in the performance of this duty, shall be subject to a fine of five dollars, to be collected by the Treasurer.

Sec. 11. The Clerks shall transmit to the Treasurer the names of members [illegible] in taxes, with the amounts severally due from each, and what notice he has given to each delinquent of his indebtedness.

CHAPTER V.

Members

Sec. 1. Each member of the Society shall have free access to the records of the Society, and of the County Association to which he belongs, and may take attested copies thereof if he request them.

Sec. 2. All the members of the Connecticut Medical Society have the privilege of attending all meetings of the Trustees and Fellows, and performing all the duties of Fellows, except voting. Honorary Members shall have the privilege of a seat at the Annual Convention, and of taking part in discussions; but they shall not vote on any question, nor be eligible to any office.

Sec. 3. The payment of the annual tax shall be optional with all members over sixty years of age.

Sec. 4. Any member of the Society who shall make, vend, or publicly recommend, or who is directly or indirectly interested in the manufacture, use or sale of any nostrum or patent medicine, shall not be eligible to any office, and is liable to be suspended from the privileges of the Society, or to expulsion.

Sec. 5. No member of the Society shall hold professional consultation or intercourse with any other than licensed Physicians and Surgeons in regular standing.

Sec. 6. It shall be the duty of each member of this Society to accuse any other member of the Society, for such misdemeanors as he deems contrary either to the By-Laws, Medical Police, or Rules and Regulations, adopted by the Society; and the accuser shall proceed in the manner directed in Chapter IV, Sec. 7, of By-Laws.

CHAPTER VI.

Elections

Sec. 1. All elections for Officers of the Society shall be at the Annual Meeting of the Trustees and Fellows, and by ballot; and a majority of votes shall be requisite to elect.

Sec. 2. Before the Trustees and Fellows proceed to ballot, the Committee on Nominations shall present a list of candidates for the several offices to be elected; and, an opportunity having been given to the members to make other nominations, the Society shall then be called to ballot; if no election is effected on the first canvass, the two highest shall be the candidates for the next balloting. When a choice is made, the persons chosen shall hold their office during one year, and until others shall be elected.

Sec. 3. The Nominating Committee shall report names for delegates to the American Medical Association, and to corresponding Societies, and shall also nominate a Committee of Arrangements, whose duty it shall be to provide [illegible] accommodations for the next Annual Convention, and an Anniversary Oration, who shall preside at the dinner of the next year. The Anniversary Chairman shall be one of the Committee of Arrangements.

CHAPTER VII.

The Society adopts the Code of Ethics of the American Medical Association, as a part of its Constitution and By-Laws.

No article of the By-Laws, as now adopted, shall be altered or amended, except the subject proposed shall have been submitted in writing to the consideration of the President and Fellows at a previous annual meeting; and a vote of two-thirds of the members present in that body, shall be necessary to ratify and confirm any amendment.

On the day of the Annual Convention, a dinner shall be provided, at the expense of those members partaking of it. Delegates from other societies, and invited guests, shall be provided for under the direction of the Committee of Arrangements.

An invitation to the dinner may be given to such eminent persons as the President of the Society, or Anniversary Chairman, shall think proper to notice in this manner.

The following By-Laws not having been repealed, are supposed to be still in force.—*Sec. Conn. Med. Soc.*

In place of the old debenture system, which is abolished, the taxes of the President and Fellows and Delegates in attendance at the Convention, shall be abated.

The Fellows of the Society shall be a Committee of Abatements in their respective Counties.

No debenture bill shall be paid by the Treasurer, that is more than seventeen years old.

Each County Meeting shall have the power to examine and immediately expel any member notoriously in the practice of Homœopathy, Hydropathy, or any other form of quackery, without any formal trial, the same to be ratified by the succeeding Convention, any By-Laws to the contrary notwithstanding. (*See By-Laws of* 1834.)

Resolved, That the several County Meetings are hereby instructed to continue their investigations in relation to the manufacture, sale, recommendation and use of nostrums or Patent Medicines, by their Members, and to present for trial any Members so offending. *Passed, May*, 1853.

Resolved, That the several County Meetings be requested to investigate the subject of Members of the Society consulting with irregular practitioners, and enforce the by-law in such case made and provided. *Passed, May*, 1857.

Resolved, That it shall be the duty of the Clerks of the several Counties to report to the Secretary of the State Convention, on the first day of its session, the names, ages and diseases of the Members of this Society who may have died during the year preceding the 1st of April in each year, in their several County Societies, and that the Secretary be directed to append these statistics to the catalogue of Members of the Society in the published proceedings of the Annual Convention. *Passed, May*, 1849.*

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* This By-Law is modified by the adoption of the plan of a Mortuary Tablet introduced this year, 1851.

Resolved, That this Society require of the several County Meetings to censure all Members who persistently refuse or neglect to pay their annual taxes. *Passed, May*, 1842.

Whereas, Doubts have existed as to the construction of membership after absence from this State—

Resolved, That the privileges and obligations of membership revert to a regular physician on returning to the State. *Passed, May*, 1844.

CHAPTER VIII.

Honorary Degrees and Honorary Membership.

Resolved, That the Committee on Honorary Degrees be directed to recommend none who have commenced the practice of medicine since the year 1815. *Passed, May*, 1837.

Resolved, That no Member of this Society shall be recommended to the President and Fellows of Yale College for the Honorary Degree of Doctor of Medicine, until such Member shall have been in the practice of medicine for a period of twenty-five years, at least, and no more than one shall be recommended from this State in any one year, and such degree shall be conferred solely on the ground of distinguished merit and honor of the individual. *The Committee on Honorary Degrees in* 1856, *recommended the adoption of the above Resolution, and the Report of the Committee was accepted.*

Resolved, That the names of candidates for the Honorary Degree of Doctor of Medicine and Honorary Membership be published in the Proceedings of the Society, and be not acted upon for one year subsequent to the time such nominations are made. *Passed, May*, 1860.

CHAPTER IX.

Of Medical Students.

1. Before any person can be admitted into the office of a Physician, as a Student of Medicine, he shall furnish evidence of good moral character, and shall be examined by the preceptor and one of the Fellows of this Society; the examination to be upon the subjects of English education, and Greek and Latin languages. If found qualified, he is to receive a certificate to that effect, and be enrolled as a regular student of medicine. *Passed, May*, 1843.

2. The following certificate of studies shall be required of all candidates for examination for a Degree:

I hereby certify that ——— ——— has pursued the study of Medicine with me from ——— to ——— and that he recited regularly on [here insert the branches pursued] during the above mentioned time.

———, Physician.

Resolved, That it is the opinion of this Convention, that in case the student recommended from any County is not accomplished and meritorious, it has full power to declare that a vacancy exists, and may proceed to fill the same. *Passed, May*, 1846.

Order of Business at the Annual Meeting of the President and Fellows.

Organization.

Presentation of certificates to the Secretary, who, with two Fellows appointed by the President, shall examine the same, and the Secretary shall report the names of those approved, together with the names of the Officers present, and Delegates from corresponding Societies.

Business Committee, appointed by President.

Unfinished business of previous year disposed of.

Committee on Nominations, appointed by county delegations.

Reception and reference, without debate, of communications, resolves, &c., from the several Counties and members of the Convention.

Committee to nominate one or more Essayists for the next year, which Committee shall report at the Annual Convention.

Reports of Committees appointed on County Communications, &c.

Treasurer's Report.

Committee to audit the Treasurer's report.

Report of the Nominating Committee.

Election of Officers.

Reports of Standing Committees.

Reports of Committees in the order in which business was brought forward in the meeting.

Miscellaneous business. Ajournment.

Order of Business in Annual Convention.

Organization.

List of New Members read by the Secretary.

The President's Address.

Written Reports, Essays, Reports of Delegates to and reception of Delegates from other Societies, &c., in the order arranged by Business Committee.

Any propositions or suggestions, conducive to the welfare of the Society, or to the general interests of Medicine, may be brought forward by any member. The Society shall decide by vote whether to engage in the consideration of the same.

It will be in order at any time, if questions of interest are suggested by the debates in Convention, to appoint a special committee on the same, to report at the next Convention.

Communications offered by persons not members of the Society, shall be received by a major vote of the Society.

Report of Committee to nominate Essayists for ensuing year.

Adjournment to dinner.

The Order of Business may be suspended by a vote of two-thirds of those present and voting.

EDITORIAL NOTICES.

N. B.—The Connecticut Medical Society are not responsible for the opinions advanced in any of the papers they publish, except where reports of Committees are approved by special vote.

The Committee of Publication would suggest to contributors the importance of GREAT CARE IN THE PREPARATION OF PAPERS INTENDED FOR PUBLICATION, as it sometimes causes unnecessary delay to allow the authors of papers to make corrections when the matter is in type.

TO CLERKS OF COUNTY ASSOCIATIONS.

The Committee would also call attention to the fact that the Secretary is *required* to prepare and circulate a PROGRAMME of the literary exercises before the meeting of the Convention. To allow the proper preparation of such a programme, all papers intended for publication should be sent to the Publishing Committee *before* the Tenth day of May. Reports of County Clerks should also be sent promptly to the Secretary, BEFORE THE FIRST OF MAY, as the By-Laws of the Society require.

THE REPORTS OF COUNTY CLERKS should include,

1st. The names of Officers and Fellows of the County Associations.

2nd. Names and residences of members, with special notices of new members elected during the year.

3rd. Name of County Student elected.

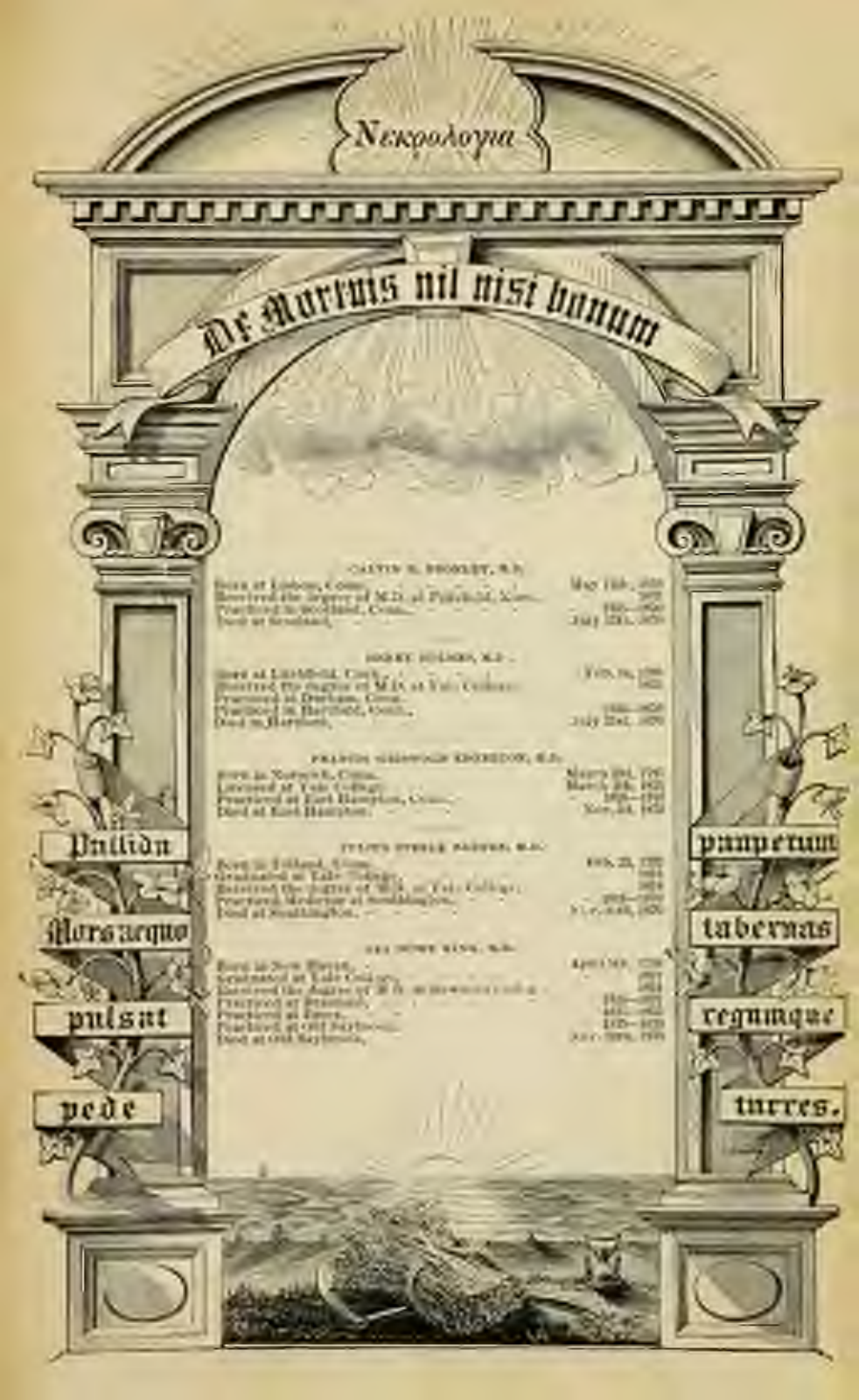
4th. Titles, and names of authors, of all papers recommended for publication.

5th. Names of all members who have died during the year, with date of birth and death, date of Diploma or License, with any other facts necessary for publication in the Annual Mortuary Tablet.

The Proceedings are sent by mail to all members of the Society not in arrears for taxes; to all Honorary Members and to Delegates from other societies; to the Secretaries of other State Societies; to Editors of Medical Journals who desire them. Persons entitled to the Proceedings, who fail to receive them, are requested to send their names and Post Office address to the Secretary.

Matters connected with the new Charter approved by the Legislature, new By-Laws, and the preparation of the Mortuary Tablet, have delayed the Proceedings beyond the ordinary time of Publication.

M. C. WHITE,
Secretary of the Conn. Med. Society.
113 George Street, New Haven, Conn.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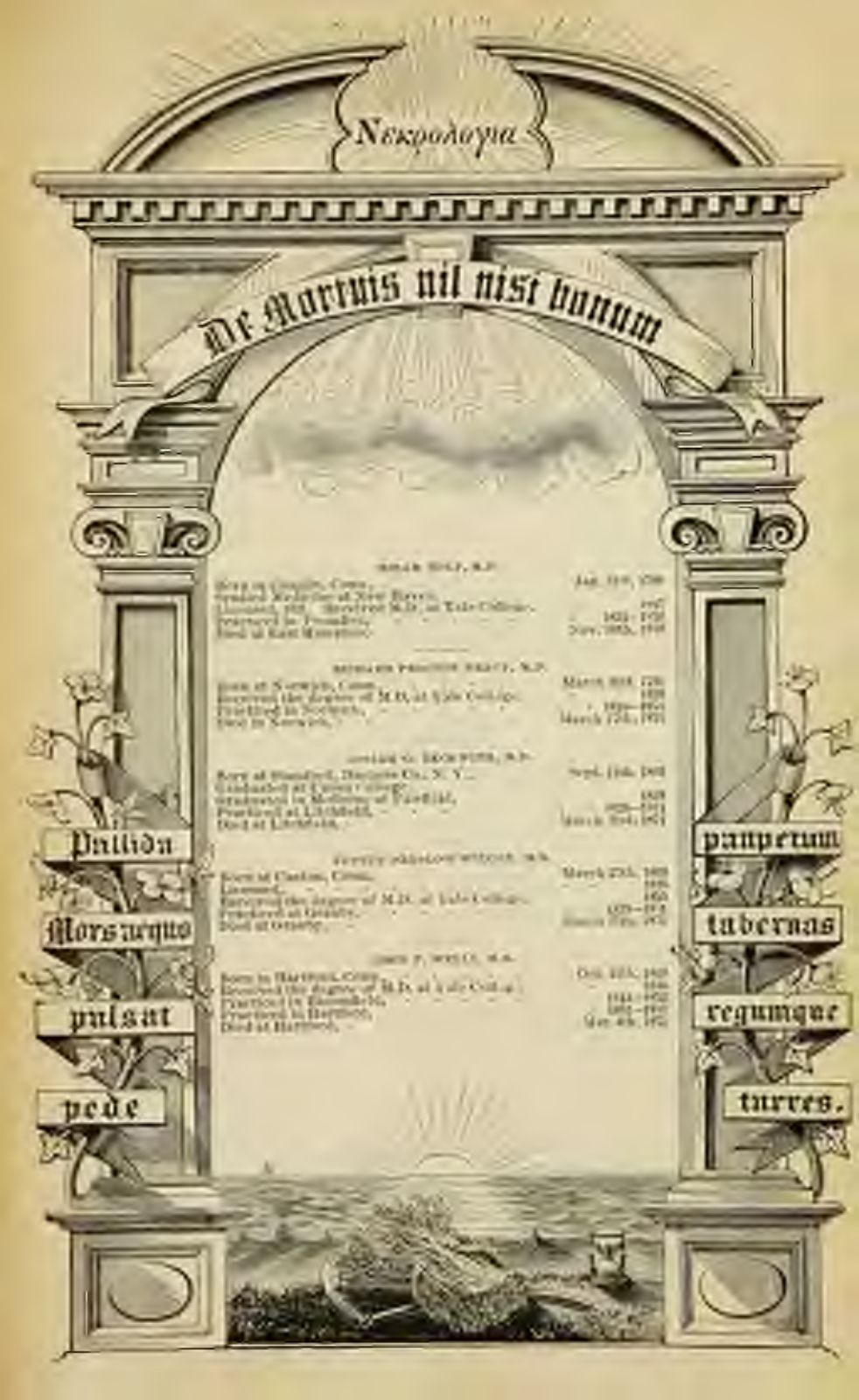
Νεκρολογια
De Mortuis nil nisi bonum
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Mors aequo
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regumque
turres.

PROCEEDINGS.

The *Eightieth* Annual Meeting of the President and Fellows of the Connecticut Medical Society was held at Stedman's Hall, in the city of Hartford, May 24, 1871.

The meeting was called to order by the Vice-President, Gurdon W. Russell, M.D., who appointed A. W. Barrows, M.D., and Lowel Holbrook, M.D., a Committee on Credentials.

The Committee reported the list of Fellows elected. The Report was approved, and the list was read by the Secretary, as follows, viz:—

HARTFORD COUNTY.

A. W. Barrows, M.D.
G. W. Sanford, M.D.
Wm. Seelz, M.D.
H. C. Bunce, M.D.
Geo. C. Jarvis, M.D.

NEW HAVEN COUNTY.

David A. Tyler, M.D.
Wm. B. DeForest, M.D.
H. A. Carrington, M.D.
B. F. Harrison, M.D.
R. F. Stillman, M.D.

NEW LONDON COUNTY.

*L. S. Paddock, M.D.
A. Woodward, M.D.
I. G. Porter, M.D.
F. Morgan, M.D.
*Levi Warren, M.D.

FAIRFIELD COUNTY.

*Samuel Sands, M.D.
Jas. G. Gregory, M.D.
*W. A. Lockwood, M.D.
*M. B. Pardee, M.D.
*R. L. Higgins, M.D.

LITCHFIELD COUNTY.

*J. W. Bidwell, M.D.
Orlando Brown, M.D.
C. W. Bull, M.D.
*T. S. Hanchett, M.D.
*W. J. Beach, M.D.

* Absent.

† Corrected numbering. The First Annual Meeting was held in 1792.

MIDDLESEX COUNTY.

M. C. Hazen, M.D. R. W. Mathewson, M.D.
F. D. Edgerton, M.D.

TOLLAND COUNTY.

J. A. Warren, M.D. Wm. N. Clark, M.D.
S. G. Risley, M.D.

WINDHAM COUNTY.

J. Hammond, M.D. J. B. Whitcomb, M.D.
L. Williams, M.D. T. M. Hills, M.D.
L. Holbrook, M.D.

The President, Charles F. Sumner, M.D., arrived, and took the chair.

The President appointed as Business Committee, Drs. M. C. White, G. W. Russell and Wm. N. Clark.

The Nominating Committee appointed by the County Delegations was announced as follows:

Geo. W. Sanford, M.D., Hartford County.
David A. Tyler, M.D., New Haven "
Ashbel Woodward, M.D., New London County.
Jas. G. Gregory, M.D., Fairfield "
Joshua Hammond, M.D., Windham "
Orlando Brown, M.D., Litchfield "
F. D. Edgerton, M.D., Middlesex "
Stephen G. Risley, M.D., Tolland "

Dr. C. A. Lindsley offered amendments to supply defects in the By-laws, which, after some discussion, were withdrawn by the mover.

Hiram Corliss, M.D., Delegate from the Medical Society of New York, and F. H. Peckham, M.D., Delegate from Rhode Island Medical Society, presented their credentials, and were introduced to the meeting.

The President appointed as a Committee on County Resolves and Communications from Members, Wm. B. DeForest, M.D., Wm. Scott, M.D., and Lewis Williams, M.D.

A resolution of the American Medical Association, in regard to Preliminary Education of Medical Students, and a By-Law of the Connecticut Medical Society on the same subject, passed in 1847, were referred to the Committee last named.

A resolution presented by Dr. DeForest, in regard to revision of the By-laws, received the same reference.

The President appointed as Committee on Gratuitous Students, A. W. Barrows, M.D., J. R. Whitcomb, M.D., and James G. Gregory, M.D.

On motion of Dr. Harrison, it was

Voted, That in explanation of the By-Laws, it is understood that the President elected last year should preside this year, and the President to be elected this year should serve for next year.

Dr. R. W. Mathewson offered a resolution—

That the Treasurer be directed to furnish a copy of Braithwaite's Retrospect, or some other Journal of equal value, to all members who pay the tax for this year before the first of January next.

The resolution was referred to the Committee on County Resolves.

The President appointed M. C. White, M.D., and G. W. Russell, M.D., a Committee to nominate Essayists for the ensuing year (to report to the Convention to-morrow).

The Treasurer presented his Annual Report. H. C. Bance, M. D., and T. M. Hills, M.D., were appointed to audit the Treasurer's Report.

They reported that the Treasurer's Accounts were found correct.

The Treasurer's Report was then approved and ordered on file.

General Summary.

May 24, 1870.	Balance in Treasury,	$138.87½
May 23, 1871.	Received during the year,	498.25
		$637.12½
May 23, 1871.	Disbursements during the year,	338.33
	Balance carried to new account,	$298.79½
	Due from Clerks and ex-Clerks,	$1,562.61
	Deduct three-fourths of this for abatements, commissions, bad debts, etc.,	1,172.70 390.91
		$688.70½
	The Society owes for Debentures outstanding,	169.25
	Leaving a Balance in favor of the Society,	$519.45½
	Balance last year,	384.23
	Increase of balance over last year,	$135.22½

Note.—The Engraving, Electrotyping and Printing the Memorial Tablets in the Proceedings for 1870 were paid by private subscription, amounting to $61.00.

COMMITTEE OF PUBLICATION.

The Committee on Communications from Members, County Associations and other Societies reported as follows, viz.:

Your Committee, to whom was referred a communication from the American Medical Association* in relation to the proper educational qualifications of students of medicine; and also a portion of the By-laws contained in Chap. IX, which requires that every student of medicine shall be examined by his preceptor and one of the Fellows of this Society upon the subject of English education, and Greek and Latin language, before he can be admitted as a student in a physician's office, &c., beg leave to report, that they have considered the matters herein presented, and are unanimously of the opinion that the object sought in both these communications is highly commendable, viz: THE ELEVATION OF THE STANDARD OF MEDICAL EDUCATION; and they recommend that in all cases when practicable the By-law be complied with, but they think a wise discretion should govern in its application.

Upon the resolution referred to your Committee in relation to the revision of the By-laws, they recommend that it be referred for final action to the next regular meeting of this Society, with a full concurrence on the part of your Committee in its object.

Your Committee further report, that they have carefully considered the resolution in relation to supplying a copy of Braithwaite's Retrospect to every member of this Society; that while they believe it to be for the interest of every member of the profession to be supplied with some medical periodical, that it hardly comports with the objects of this Society to enter into the practical business of supplying its members with medical or other books. They therefore recommend that the resolution be indefinitely postponed.

All of which is respectfully submitted.

WM. B. DEFOREST,
WM. SCOTT,
LEWIS WILLIAMS.

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* *Resolution* adopted by the *American Medical Association* at *San Francisco*, 1871.

"*Resolved*, That each State and local Society be requested to provide, as a permanent part of its organization, a Board of Censors for determining the educational qualifications of such young men as propose to commence the study of medicine; and that no member of such Societies be permitted to receive a student into his office until such student presents a certificate of proper preliminary education from the committee appointed for that purpose, or a degree from some literary college of known good standing."

In 1847 the Connecticut Medical Society passed a by-law (see by-laws, Chapter IX, page 11), requiring every medical student to be examined by the preceptor and one of the *Fellows of this Society* before being entered as a student in the office of any member of this Society.

This report was adopted, and it was *voted*, that a committee of three be appointed to *harmonize* the *Bye-laws*. The Committee are Drs. C. A. Lindsley, H. M. Knight and G. H. Preston.

An invitation was received from Dr. Butler for the President and Fellows to visit the Retreat for the Insane. On motion, it was *voted*, that an evening session be held at the Retreat for the Insane at 8 o'clock this evening.

The Committee on Gratuitous Students reported the names of three students selected by counties to attend a gratuitous course of lectures in the Medical Institution of Yale College. The Committee recommended that the names of two students be added to fill vacancies. The report was adopted.

The list of Gratuitous Students approved by the Convention is as follows, viz.:

Lafon H. Johnson, of New Haven.
Elias B. Healy, of Norfolk.
Stephen Ormiel Hendrick, of Woodstock.
Terence Mahony O'Herron, of Bridgeport.
Frederick Bellosa, of New Haven.

Drs. B. F. Harrison and Orlando Brown were appointed tellers, and officers were elected as follows, viz.:

President—G. W. Russell, M.D., of Hartford.
Vice-President—H. W. Bean, M.D., of Litchfield.
Treasurer—J. C. Jackson, M.D., of Hartford.
Secretary—M. C. Warre, M.D., of New Haven.

Voted, That the *Annual Tax* be *two dollars*, payable June 1st, 1851.

Voted, That 500 copies of the Proceedings be published.

On recommendation of the Nominating Committee, the following gentlemen were elected to fill vacancies in the Standing Committees, viz:—

On Committee of Examination—T. S. Hanchett, M.D., and D. A. Tyler, M.D.

On Committee to Nominate Professors in the Medical Institution of Yale College—E. B. Nye, M.D., and S. Lynes, M.D.

On Committee to Nominate Physician to the Retreat for the Insane—C. M. Carlton, M.D., and J. E. Whitcomb, M.D.

On Committee of Publication—G. W. Russell, M.D., and L. J. Sanford, M.D.

Committee of Arrangements—H. A. Carrington, M.D., D. L. Daggett, M.D., and C. A. Lindsley, M.D.

Director—H. M. Knight, M.D.

Alternate—L. J. Sanford, M.D.

On Committee on Matters of Professional Interest in the State—H. W. Buel, M.D., and F. D. Edgerton, M.D.

Delegates to other Societies were elected as follows, viz:—

To the American Medical Association—B. B. North, M.D., A. Woodward, M.D., D. L. Daggett, M.D., Lewis Williams, M.D., S. G. Risley, M.D.

To the Maine Medical Association—L. Holbrook, M.D., Wm. Porter, M.D.

To the New Hampshire Medical Society—A. W. Barrows, M.D., and G. H. Preston, M.D.

To the Vermont Medical Society—J. A. Warren, M.D., and Myron Downs, M.D.

To the Massachusetts Medical Society—E. W. Blake, M.D., and Orlando Browne, M.D.

To the Rhode Island Medical Society—Edwin A. Hill, M.D., and J. Hammond, M.D.

To the New York Medical Society—M. B. Parker, M.D., H. G. Gates, M.D., Francis Bacon, M.D., G. W. Sanford, M.D., and Wm. Woodruff, M.D.

To the New Jersey Medical Society—J. B. Derrickson, M.D., and C. A. Lindsley, M.D.

The Report of the Committee on Registration of Regular Practitioners of Medicine in the State was read and accepted, and ordered to be printed. (See Appendix B.)

The Secretary was directed to send a copy of said Report to the appropriate Committee of the American Medical Association.

Adjourned, to meet at the Retreat for the Insane at 8 P. M.

Evening Session.

At 8 P. M. the President and Fellows assembled at the Insane Retreat, and were called to order by the President, C. F. Sumner, M.D.

The following preamble and resolution were unanimously adopted:

WHEREAS, it is understood that Henry Bronson, M.D., has prepared a paper on *Intermittent Fever*, which would have been presented to the Annual Meeting this year had not ill health prevented;

Resolved, That Dr. Bronson be requested to furnish a copy of his paper on Intermittent Fever for publication in the Proceedings this year.*

On motion of the Secretary, it was

Voted, That in case it shall be ascertained that any routine business has been overlooked, the President be authorized to call the Fellows together at 12 M. to-morrow, during a temporary recess of the Annual Convention of the Society, to attend to said business.

The President and Fellows, with Delegates from other Societies, were then escorted by Dr. Butler, the Superintendent, through several wards of the Retreat, and the recent improvements and most excellent arrangements of the Institution were carefully explained, to the great satisfaction of all.

After partaking of a bountiful collation, provided by Dr. Butler, the meeting adjourned.

At 12 M., May 25, the Fellows were called to order by the President.

The Secretary stated that the nomination of Dr. Bowen of Bridgeport as an honorary member had not been acted upon. It was voted to let the case lie over until next year.

The Annual Meeting of the Fellows then adjourned to May, 1872.

Attest: M. C. WHITE, M.D., *Secretary.*

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* Dr. Bronson's paper is not ready for publication this year.

THE ANNUAL CONVENTION

Of the Connecticut Medical Society was held at Stedman's Hall, Thursday, May 25, 1871.

The Convention was called to order at 9 A. M., by the President, C. F. Sumner, M.D.

The list of officers was read, and the Vice-Presidents took seats upon the stage.

G. W. Russell, M.D., Vice-President and President-elect.
H. W. Bull, M.D., Vice-President.
Wm. Scott, M.D.
David L. Daggett, M.D.
Isaac G. Porter, M.D.
Ira Gregory, M.D.
A. R. Goodrich, M.D.
Ira Hutchinson, M.D.
} Vice-Presidents, ex-officio.

Credentials of Delegates from other Societies were read, and the Delegates were introduced to the Convention, viz:

Hiram Corliss, M.D., New York State Medical Society.

Robert Newman, M.D., New York State Medical Society.

Thomas W. Perry, M.D., Rhode Island Medical Society.

Fenner H. Peckham, M.D., Rhode Island Medical Society.

The Secretary read the list of members who have united with the Society during the year. Their names are printed in the regular lists. The Secretary read also the names of members who had died during the past year. (See Memorial Tablets.)

The Business Committee announced the arrangements for the Literary Exercises.

G. W. Russell, M.D., Vice-President and President-elect, then took the chair, when the Annual Address was delivered by the President, Chas. F. Sumner, M.D.

On motion of Dr. Carrington, it was

Voted, That a copy of the Address be requested for publication.

The Annual Dissertation was delivered by Prof. F. Bacon, M.D., on the Duties of the Medical Profession to the State.

The thanks of the Society were tendered to Dr. Bacon, and a copy of the Dissertation was requested for publication.

Remarks and observations called forth by the Dissertation were made by Dr. Corliss of New York.

Prof. S. G. Hubbard, M.D., followed with remarks on Public Hygiene, and the duty of the State to encourage Medical Education.

The Faculty of the Medical Institution of Yale College presented to the Convention the plan of a Bill for a Public Act to promote Medical Science, and asked the aid of the Convention in securing its adoption by the Legislature. Whereupon it was unanimously

Resolved—1. That we fully appreciate the great importance to the cause of Medical Science, and the best interests of the Medical Department of Yale College, of the Bill for a Public Act, entitled an "Act to promote Medical Science" submitted herewith to the General Assembly, and this Society cordially unites with the Faculty of the Medical Institution of Yale College in requesting its passage by the General Assembly.

Resolved—2, That the Secretary of this Society be and he is hereby instructed to present a certified copy of the foregoing to the General Assembly.

The Committee to nominate essayists recommended the following appointments, which were adopted by the Convention, viz:

J. S. Butler, M.D., on *Prevention of Insanity.*

C. W. Bull, M.D., on *Bright's Disease.*

Wm. B. DeForest, M.D., on *Public Hygiene.*

J. C. Jackson, M. D., on *Life Insurance.*

S. W. Rockwell, M.D., on *Treatment of Typhoid Fever.*

Geo. A. Ward, M.D., on *Wounds of the Heart.*

H. A. Carrington, M.D., then read the Report of the Committee on matters of Professional Interest in the State. The Report was referred to the Committee of Publication.

Dr. M. C. White then read a paper on Chloral Hydrate, a copy of which was requested for publication.

The Society then adjourned.

Attest: M. C. WHITE, M.D., *Secretary.*

The Members of the Society and invited guests then repaired to the United States Hotel, and partook of the annual dinner prepared by the Committee of Arrangements.

OFFICERS OF THE SOCIETY

FOR 1871--72.

PRESIDENT,
GURDON W. RUSSELL, M.D., OF HARTFORD.

VICE-PRESIDENT,
HENRY W. BUEL, M.D., OF LITCHFIELD.

VICE-PRESIDENTS, *Ex officio*,
WM. SCOTT, M.D., OF MANCHESTER.
DAVID L. DAGGETT, M.D., OF NEW HAVEN.
IRA GREGORY, M.D., OF NORWALK.
ISAAC G. PORTER, M.D., OF NEW LONDON.
IRA HUTCHINSON, M.D., OF CHOWDERE.
A. R. GOODRICH, M.D., OF VERNON DEPOT
LOWEL HOLBROOK, M.D., OF THOMPSON.

TREASURER.
JAMES C. JACKSON, M.D., OF HARTFORD.

SECRETARY,
MOSES C. WHITE, M.D., OF NEW HAVEN.

STANDING COMMITTEES.

Committee of Examination.

GURDON W. RUSSELL, M.D., *Ex officio*.
ASHBEL WOODWARD, M.D.
LUCIAN S. WILCOX, M.D.
RUFUS BAKER, M.D.
LOWEL HOLBROOK, M.D.
F. L. DICKINSON, M.D.
T. S. HANCHETT, M.D.
DAVID A. TYLER, M.D.

Committee to Nominate Professors in the Medical Institution of Yale College.

STEPHEN G. RISLEY, M.D.
DAVID L. DAGGETT, M.D.
H. W. BUEL, M.D.
ELISH B. NYE, M.D.
SAMUEL LYNES, M.D.

Committee to Nominate Physician to the Retreat for the Insane.

H. M. KNIGHT, M.D.
P. M. HASTINGS, M.D.
G. L. PLATT, M.D.
C. M. CARLETON, M.D.
J. B. WHITCOMB, M.D.

Committee on Matters of Professional Interest in the State.

H. A. CARRINGTON, M.D.
H. W. BUEL, M.D.
F. D. EDGERTON, M.D.

Committee of Publication

MOSES C. WHITE, M.D., *Enrolled.*
GURDON W. RUSSELL, M.D.
LEONARD J. SANFORD, M.D.

Committee of Arrangements

H. A. CARRINGTON, M.D.
D. L. DAGGETT, M.D.
C. A. LINDSLEY, M.D.

Committee to Harmonize the By-Laws.

CHAS. A. LINDSLEY, M.D.
H. M. KNIGHT, M.D.
G. R. PRESTON, M.D.

Reporters on Medical Science.

G. S. BUTLER, M.D., on *Prevention of Insanity.*
C. W. BULL, on *Bright's Disease.*
WM. B. DEFOREST, M.D., on *Public Hygiene.*
J. C. JACKSON, M.D., on *Life Insurance.*
S. W. ROCKWELL, M.D., on *Treatment of Typhoid Fever.*
GEO. A. WARD, M.D., on *Wounds of the Heart.*

Dissertator—H. M. KNIGHT, M.D.
Alternate—L. J. SANFORD, M.D.

MEMBERS OF THE SOCIETY.

HONORARY MEMBERS.

*FELIX PASCALIS,	New York City.
JAMES JACKSON,	Boston, Mass.
*JOHN C. WARREN,	Boston, Mass.
*SAMUEL L. MITCHELL,	New York City.
*DAVID HOSACK,	New York City.
*WRIGHT POST,	New York City.
*BENJAMIN SILLIMAN,	New Haven.
*GEORGE MUHLLAN,	Philadelphia, Pa.
*JOHN MACKIE,	Providence, R. I.
*CHARLES SLOCUMB,	East Greenwich, R. I.
*THEODORIC ROMEYN BECK,	Albany, N. Y.
*JAMES THACHER,	Plymouth, Mass.
EDWARD DELAFIELD,	New York City.
JOHN DELAMATER,	Cleveland, O.
*WILLIAM P. DEWEES,	Philadelphia, Pa.
*JOSEPH WHITE,	Cherry Valley, N. Y.
JACOB BIGELOW,	Boston, Mass.
WALTER CHANNING,	Boston, Mass.
*PHILIP SYNG PHYSIC,	Philadelphia, Pa.
*LEWIS HERMAN,	U. S. Navy.
*DANIEL DRAKE,	Cincinnati, O.
*HENRY MITCHELL,	Norwich, N. Y.
NATHAN RYNO SMITH,	Baltimore, Md.
*VALENTINE MOTT,	New York City.
*SAMUEL WHITE,	Hudson, N. Y.
*REUBEN D. MUSSEY,	Cincinnati, O.
*WILLIAM TULLY,	Springfield, Mass.
RICHMOND BROWNELL,	Providence, R. I.
*WILLIAM BEAUMONT,	St. Louis, Mo.
SAMUEL HENRY DICKSON,	Philadelphia, Pa.
*SAMUEL B. WOODWARD,	Northampton, Mass.
*JOHN STEARNS,	New York City.
*STEPHEN W. WILLIAMS,	Deerfield, Mass.
*HENRY GREEN,	Albany, N. Y.
*GEORGE FROST,	Springfield, Mass.
WILLARD PARKER,	New York City.
*BENAJAH TICKNOR,	U. S. Navy.
*ALDEN MARCH,	Albany, N. Y.
*AMOS TWITCHELL,	Keene, N. H.

* Deceased.

CHARLES A. LEE,	New York City.
*DAVID S. C. H. SMITH,	Providence, R. I.
*JAMES M. SMITH,	Springfield, Mass.
HENRY D. BULKLEY,	New York City.
J. MARION SYMS,	New York City.
*JOHN WATSON,	New York City.
FRANK H. HAMILTON,	Brooklyn, L. I.
*ROBERT WATTS,	New York City.
J. V. C. SMITH,	New York City.
O. WENDELL HOLMES,	Boston, Mass.
JOSEPH SARGENT,	Worcester, Mass.
*MASON F. COGSWELL,	Albany, N. Y.
FOSTER HOOPER,	Fall River, Mass.
*THOMAS C. BRINSMADE,	Troy, N. Y.
GEORGE CHANDLER,	Worcester, Mass.
GILMAN KIMBALL,	Lowell, Mass.
JAMES McNAUGHTON,	Albany, N. Y.
*USHER PARSONS,	Providence, R. I.
*S. D. WILLARD,	Albany, N. Y.
*JOHN WARE,	Boston, Mass.
EBENEZER ALDEN,	Randolph, Mass.
E. BORDYCK BARKER,	New York City.
JOHN G. ADAMS,	New York City.
JARED LINSLEY,	New York City.
A. J. FULLER,	Bath, Me.
SAMUEL H. PENNINGTON,	Newark, N. J.
FREDERICK S. BENNETT,	Orange, N. J.
*THOMAS W. BLATCHFORD,	Troy, N. Y.
THOMAS C. FINNELL,	New York City.
N. C. HUSTED,	New York City.
JACOB F. WHITTEMORE,	Chester, N. H.
JOHN GREEN,	Worcester, Mass.
THOMAS SANBORN,	Newport, N. H.
WILLIAM PIERSON,	Orange, N. J.
ARTHUR WARD,	Belleville, N. J.
HIRAM CORLISS,	Washington, N. Y.
E. K. WEBSTER,	Dunstable, N. H.
F. A. STACKPOLE,	Dover, N. H.
S. F. L. SIMPSON,	Concord, N. H.
A. T. WOODWARD,	Vt.
WM. McCULLOM,	Vt.
J. C. HUTCHINSON,	Brooklyn, N. Y.
BENJ. S. CUTTING,	Boston, Mass.
HENRY I. BOWDITCH,	Boston, Mass.
SETH SHOVE,	Keeseville, N. Y.
SAMUEL T. HUBBARD,	New York City.

* Deceased.

ORDINARY MEMBERS.

The names of those who have been Presidents are in Capitals

HARTFORD COUNTY.

WM. DUTTY, M.D., *of Manchester, President.*

H. S. PERKINS, M.D., *of Hartford, Clerk.*

HARTFORD, S. B. BERESFORD, G. B. Bowley, G. W. BUSSELL, David Cory, P. W. Ellsworth, E. K. HUNT, J. S. Butler,* J. C. Jackson, A. W. Barrows, Thomas Miner,* William R. Brownell, P. M. Hastings, Edward Brinley, W. H. Tremaine, Lucius S. Wilcox, Henry P. Stearns, S. C. Preston, Irving W. Lyon, Daniel Pull, Morrison Stowe, Horace S. Fuller, John O'Flaherty, Nathan Mayer, Wm. M. Hudson, Geo. C. Jarvis, C. E. Hart, Morton W. Easton, W. A. M. Wainwright, E. M. Dunbar, David Cory, Jr., George F. Bartley, J. E. Lewis, D. T. Brumley, Geo. P. Dunn, C. A. Tuttle & Tilly de Cotret.

RIPLEY, E. Stoddard.

HAZARDVILLE, Henry Gray.

BROADBROOK, E. E. Leonard.

CANTON, Collinsville, R. H. Tiffany, Geo. E. Shepherd.

EAST GRANBY, Chester Hanks.*

EAST HARTFORD, S. L. Gibbs, Edward R. Brownell, L. W. McIntosh.

EAST WINDSOR HILL, Sidney W. Rockwell, William Wood.

WAPPING, Marcus L. Fisk.

ROCKVILLE, Thompsonville, Edward P. Parsons, Rial L. Strickland, Henry K. Childs.

FARMINGTON, Frank Wheeler, Charles Brownell, P. M. Hastings, Edward Carrington.

PLAINVILLE, G. A. Moody.

GRANBY, (North,) Francis F. Allen,* G. W. Edwards.

GLASTENBURY, H. C. Bunce.

SOUTH GLASTENBURY, G. A. Hubbard, H. Hudson, Geo. C. Jarvis, C. E. Hart, M. Rising.

MANCHESTER, William Scott.*

NEW BRITAIN, B. N. Comings, S. W. Hart, Geo. Clary, F. E. Lyon, J. S. Stone.

ROCKY HILL, R. W. Griswold.

SIMSBURY, Tariffville, G. W. Sanford.*

WETHERSFIELD, N. H. Brington,* F. A. Hart.

SUFFIELD, Aretas Ensing,* J. E. Mason.

WEST HARTFORD, Edward Bruce.*

WETHERSFIELD, E. F. Cook,* A. S. Warner.

WINDSOR, A. Morrison, S. A. Wilson.

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* Over sixty years of age.

NEW HAVEN COUNTY.

DAVID L. DAGGETT, M.D., of New Haven, President.

EDWARD EDELEE, M.D., of New Haven, Clerk.

New Haven, E. H. Bishop,* Levi Ives, Antonio, C. W. Shaffer, David L. Daggett, George O. Sumner,* David A. Tyler, HENRY BRONSON,* E. A. Park, S. G. Hubbard, H. W. S. Mathews, C. A. Lindsley, T. B. Tyron, John Nicoll, Moses C. White, H. Fairchild, J. H. Beecher, Leonard J. Sanford, Chas. L. Ives, Edward Bulkley, W. B. DePuron,* F. L. Dibble, T. Beers Townsend, Evelyn L. Beach, T. H. Bishop, 2d, W. Hooker, Henry A. DeForest, Francis Bacon, C. O. Stockman, Charles A. Gallagher, W. Lockwood Bradley, A. E. Winchell, H. A. Carrington, George E. Fisher, G. W. Peck, L. M. Gilbert, Robert S. Ives, F. J. Whittemore, Archer Reichelt, H. L. Wilson, C. J. DeForest, Stephen H. Ironson, Willis G. Alling, Frank Gallagher, Walter B. Bartlett.

Fair Haven, Charles A. Thomson,* W. H. Thomson, Wm. H. White.

Westville, J. W. Barker.

Branford, H. Y. C. Holcomb, Newton B. Hall.

Cheshire, A. J. Driggs, M. N. Chamberlain.

Derby, Charles H. Fairey.

Birmingham, Ambrose Beardsley.

Guilford, Joel Canfield,* Alvan Talcott, G. P. Reynolds.

North Guilford, Justin Smith.

Harden, Edwin D. Swift, O. F. Treadwell.

Madison, D. M. Webb.

Meriden, (West) E. B. CATLIN, Asa H. Churchill, James G. Bacon, Jas. J. Averill, Frederick J. Fitch, C. H. S. Davis, Charles H. Gaylord.

Milford, Hall Allen,* L. N. Beardsley, Thomas Dutton.

Naugatuck, J. D. Mears.*

North Branford, Sheldon Beardsley.*

North Haven, H. F. Sillman.

Orange, West Haven, J. Martin Ames.

Oxford, Lewis Barnes.

Seymour, Thos. Shepherd, S. C. Johnson, Joshua Kendall.

Southbury, A. B. Booth.*

South Britain, S. C. Baldwin.

Wallingford, Nehemiah Banks, E. F. Harrison.

Waterbury, G. L. Platt, John Deacon, George S. Perkins, Thos. Dougherty, Alfred North, Edward L. Griggs.

Woodbridge, David M. Ellwood.

NEW LONDON COUNTY.

ISAAC G. PORTER, M.D., of New London, President.

ALBERT T. CHAPMAN, M.D., of Mystic, Clerk.

New London, ISAAC G. PORTER,* D. P. Francis, Robert A. Manwaring, A. W. Nelson, F. S. Bronson, Henry Foster.

Bozrah, Samuel Johnson.*

Colchester, Ezekiel W. Parsons,* Frederick Mangus.*

Franklin, ASHBEL WOODWARD.

Greenville, Wm. Witter.

Groton, Mystic River, A. W. Coates, John Gray.

Lebanon, Ralph Green.*

Mystic, Moses Manning,* Albert T. Chapman.

Norwich, Elijah Dyer,* Elisha Phinney,* A. B. Hale, Lewis S. Paddock, Chas. M. Carleton, F. S. Aldrich, Wm. S. C. Perkins, Patrick Cassidy, Thomas T. Graves, Levi Warren.

Old Lyme, Richard Noyes,* Geo. W. Hatch.

Stonington, William Hyde,*

Mystic Bridge, E. Frank Coates.

* Over sixty years of age.

FAIRFIELD COUNTY.

IRA GREGORY, M.D., of Norwalk, President.

GEORGE L. BEERS, M.D., of Bridgeport, Clerk.

Southport, Justus Sherwood,* Edward H. Winslow.
Bridgeport, William B. Nash,* David H. Nash, Robert Hubbard, H. L. W. Burritt, Elijah Gregory, Geo. L. Beers, Andrew J. Noble, Augustus H. Abernethy, George F. Lewis, James R. Cumming, Gustave Ohmeorg, George L. Porter, James D. Brown, Robert Lawlor.
Brookfield, A. L. Williams.
Danbury, R. P. Bennett,* James Baldwin,* William C. Bennett.
Darien, Samuel Sands.
Easton, B. W. Munson.
New Canaan, Samuel S. Noyes,* Lewis Richards,* William G. Brownson.
Norwalk, Ira Gregory,* Samuel Lynes, James G. Gregory, James R. Barlow, W. A. Lockwood, John W. McLean.
South Norwalk, M. B. Pardee, B. L. Higgins, John Hill.
Ridgefield, O. S. Hickok, Wm. S. Todd.
Stamford, N. D. Haight,* Jas. H. Hoyt.
North Stamford, Geo. W. Bush, W. H. Trowbridge.
Stratford, Roger M. Gray.
Trumbull, George Deer.*
Westport, George Blackman,* George B. Sturges.
Wilton, A. E. Emery.
Huntington, Gould A. Shelton.

WINDHAM COUNTY.

LOWEL HOLBROOK, M.D., of Thompson, President.

SAMUEL HUTCHINS, M.D., of West Killingly, Clerk.

Windham, E. Huntington, Horace E. Baldwin.
Ashford, John H. Simmons.
Brooklyn, James B. Wilcomb,* Wm. Weatherbee.
Chaplin, Orrin Witter.
Hampton, Dyer Hughes.*
Killingly, Justin Hammond.*
South Killingly, Daniel A. Harvey.*
West Killingly, Samuel Hutchins.
East Killingly, Edwin A. Hill.
Plainfield, WM. H. CORSWELL.*
Pomfret, Lewis Williams.
Putnam, H. W. Baugh,* Daniel B. Flynpike, John D. Kent.
Plainfield, Moody, Wm. A. Lewis, Charles H. Rogers.
Thompson, Lowell Holbrook, Charles Hosford.
Voluntown, Harvey Campbell.*
Westford, Parsons O. Bennett.
Woodstock, Lorenzo Marcy.*
East Woodstock, John Witter.
South Woodstock, A. S. Leonard.
West Woodstock, Milton Bradford.*
Windham, Willimantic, Fred Rogers, T. Morton Hills, L. F. Bugbee.

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* Over sixty years of age.

LITCHFIELD COUNTY.

H. W. EUEL, M.D., of Litchfield, President.

H. E. GAYER, M.D., of Litchfield, Clerk.

Litchfield, H. W. Fuel, D. E. Beetrick, H. E. Baker, Wm. Porter, W. J. Beach.
Northfield, D. B. W. Camp.*
Harwinton, Riverton, Francis J. Young.
Bethlehem, Franklin Booth.
Cornwall, Barzis B. North.*
West Cornwall, Edward Sanford.
Harwinton, Robert E. Emery.
Morris, Gary H. Miner.* Wm. Dooley.
New Milford, J. K. Boots.
Gaylord's Bridge, G. H. St. John.*
Sherman, William W. Welch.
Plymouth, Samuel T. Salisbury.
Thomaston, William Woodruff.* Ralph S. Goodwin.
Roxbury, Myron Bowen.*
Salisbury, John H. Hodget.
Lakeville, Benj. A. Welch.* W. Russell H. M. Knight.
Sharon, Ralph Dunlap.* William W. Kellogg.
Wolcottville, Erastus Bancroft.* Jeremiah W. Phelps. T. S. Bronson.
Waterbury, John S. Davidson.
Watertown, Ransom M. Fowler.* Orlando Stevens.
New Preston, Sidney B. Lyman, Edward P. Lyman.
Waterbury, W. S. Munger.
Winchester, West Winsted, Jas Welch.* John W. Bidwell.
Woodbury, Charles H. Webb, Harmon W. Shove.
Terryville, Cornelius W. Bull.

MIDDLESEX COUNTY.

IRA HUTCHINSON, M.D., of Cromwell, President.

MYRON U. HALES, M.D., of Haddam, Clerk.

Middletown, Elisha B. Nye, George W. Bigbe, John Ely, Blake, Rufus Baker, F. D. Edgerton, Noah Cressy, Sebbin W. Noyes, Abraham M. Shew, Wm. Sharp B. Hallock, Joseph W. Alsop, Jr., Daniel A. Cleaveland.
Chatham, Middle Haddam, Albert S. Worthington.
Chester, Sylvester W. Turner.
Clinton, Deodate H. Hubbard.*
Cromwell, Ira Hutchinson.*
Durham, R. W. Mallerson.
East Hampton, David P. Lavery.
Essex, Alanson H. Hough, Charles H. Hubbard.*
Haddam, Miner C. Hales.
Old Saybrook, J. H. Graham.
Portland, George G. Jarvis.* C. A. Sears. Cornelius P. Hammond.
Saybrook, Deep River, Elisha Sewell.*

TOLLAND COUNTY.

A. R. GOODRICH, M.D., of Vernon Depot, President.

GILBERT H. PRENTICE, M.D., of Tolland, Clerk.

Tolland, Oliver K. Isham.* G. H. Prentice.
Bolton, CHAS. P. SUMNER.
Coventry, Marion B. Bennett.
South Coventry, Timothy Dimock.* Henry S. Dana.
Ellington, J. A. Waters.
Manchester, Wm. H. Richardson.*
Mansfield Center, O. S. Griggs.
Mansfield Depot, Norman Fitzhugh.* Julius N. Parker.
Somers, Orson Wood.*
Stafford, Wm. N. Clark.*
West Stafford, Joshua Hodgett.*
Stafford Springs, C. B. Newton.
Vernon Depot, A. R. Goodrich.
Rockville, Stephen H. Riley, Francis L. Dobbinson.

* Over sixty years of age.

APPENDIX A.

The Committee of Examination would respectfully report that they held their Sessions for the Annual Examinations, January 11 and 12, 1871.

There were present, representing the Society,

Charles F. Sumner, M.D., of Bolton, *Ex-officio* President of the Board; Henry W. E. Matthews, M.D., of New Haven, Asahel Woodward, M.D., of Franklin, Lowel Holbrook, M.D., of Thompson, Lucius S. Wilcox, M.D., of Hartford—and representing the Faculty of the College, Professors Hubbard, Lindsley, White, Ives, Bacon, Sanford and Barker. Dr. Wilcox was appointed to report the proceedings of the Board to the State Society.

Dr. Henry M. Knight, of Lakeville, was appointed to address the graduating class in 1872, and Dr. Henry P. Stearns, of Hartford, in 1873.

The following gentlemen were successful candidates, by examinations, for Degrees; Walter Russell Bartlett, North Guilford; Thesis—Progressive Medicine. Frederick Porter Blodgett, Broad Brook; Thesis—Puerperal Convulsions. Charles Hyde Gaylord, A.M., Ashford; Thesis—Alcohol. Herbert Lacher, Bridgeport; Thesis—Shall Woman be our Physician, with the Valedictory Address. Thomas Neal McLean, New Haven; Thesis—The Union of Mind and Matter in reference to Mental Derangements. Otho Erwin Powers, West Meriden; Thesis—Typhoid Fever. Frank Wheeler Tucker, Newtown; Thesis—The Mechanism of Natural Labor. William Fisk Witter, Sturbridge, Mass; Thesis—Idiopathic Tetanus.

The general excellence of scholarship evinced in these examinations was marked, and indicated not only well sustained efforts on the part of the students during their pupilage, but most decidedly a higher standard of attainments presented to them by a board of accomplished instructors, fully and painfully appreciating their high duties to the profession and to humanity.

The graduating exercises were held at the Medical College, Thursday evening. Dr. Lauder delivered the Valedictory, and Dr. H. A. Carrington, of New Haven, made the moral address to the class. President Woolsey presided, and conferred the Degrees.

Respectfully submitted,

L. S. WILCOX, *Secretary.*

Hartford, May 24th, 1871.

APPENDIX B.

REPORT OF THE COMMITTEE ON REGISTRATION OF THE REGULAR PRACTITIONERS OF MEDICINE IN THE STATE.

In presenting their report, the Committee desire to say that, although very incomplete, it is as perfect as it can well be made under existing circumstances; and if the attempt to perfect a register is to be renewed, it is hoped that the Society will more generally and promptly second the effort.

From many members of the Society no return whatever has been received; and but few of the many regular practitioners in the State, who are not members, could be reached at all. In some instances, however, these deficiencies have been supplied by the Committee from such sources as were available, but it is presumed that the data thus obtained are more or less incorrect.

Your Committee recommend that each County Association be required to take proper steps to induce all regular practitioners in honorable standing, within its limits, to become members of the Society; and that hereafter, the Clerks of County Associations be required to send annually to the Secretary corrected lists, alphabetically arranged, of the regular practitioners in each county, including the place of graduation and date of diploma.

S. G. HUBBARD, M. D.,
Chairman.

NEW HAVEN COUNTY.

Names.	Residence.	Name of College where Graduated.	Date of Diploma or License.
Alling, W. G.	New Haven,	Yale,	1838
Almer, John M.	West Haven,	"	1853
Allen, Hull	Milford,	N. Y. Univ.	License, 1821
Averill, James J.	West Meriden,	Yale,	1850
Bacon, Francis	New Haven,	"	1853
Baron, James G.	West Meriden,		
Baldwin, N. C.	S. Britain,		
Banks, Nehemiah	Wallingford,	Yale,	1844
Barnes, Lewis	Oxford,		
Barker, George F.	New Haven,	Albany,	1861
Barker, John W.	"	Yale,	1860
Bartlett, Stephen C.	Naugatuck,	"	1866
Bartlett, Walter B.	New Haven,	"	1871
Beardsley, L. N.	Milford,	"	1858
Beardsley, Sheldon	No. Branford,	"	1832
Beardsley, Andrew	Birmingham,		
Beecher, Josiah B.	New Haven,	Yale,	1846
Bishop, E. Huggins	"	"	1859
Bishop, Timothy H.	"	"	1866
Bissell, Evelyn L.	"	"	1860
Blake, H. W.	"	"	1842
Bradley, W. Lockwood	"	"	1864
Bronson, Henry	"	"	1837
Bronson, S. Henry	"	"	1846
Bulkley, Edward Jr.	"	"	1856
Burritt, Anthony H.	Southbury,	"	1832
Canfield, Joel	Guilford,	"	1834
Carrington, Henry A.	New Haven,	Harvard,	1845
Castle, Frank E.	Waterbury,	Yale,	1859
Catlin, Benjamin H.	West Meriden,	"	Honorary, 1848
Chamberlin, Myron N.	Cheshire,	"	1846
Churchill, Asa H.	West Meriden,	"	1857
Cogan, George E.	Wallingford,	"	1867
Daggett, David L.	New Haven,	"	1843
Davis, Charles H. S.	Meriden,	N. Y. Univ.	1845
Davis, Henry	Wallingford,	Yale,	1855
Deane, John	Waterbury,	"	1847
DeForest, William B.	New Haven,	"	1849
Dibble, Frederick L.	"	"	1859
Dougherty, Thomas	Waterbury,		
Driggs, Asa J.	Cheshire,	Yale,	1825
DuBois, Cornelius J.	New Haven,	"	1866
DuBois, Henry A.	"	Coll. P. & S., N. Y.	1850
Dutton, Thomas	Milford,		
Elwood, D. M.	Woodbridge,		Ct. M. Soc. Lic. 1866
Fitch, F. J.	West Meriden,		
Gallagher, Charles A.	New Haven,	Coll. P. & S., N. Y.	
Gallagher, Frank	"	Yale,	1864
Gaylord, Chs. H.	West Meriden,	Yale,	1871
Gilbert, L. M.	"	L. I. Hosp. Coll.	1856
Goodyear, S. B.	North Haven,	Yale,	1866
Griggs, Edward L.	Waterbury,	Coll. P. & S., N. Y.	
Hall, N. R.	Branford,	Yale,	1833
Harrison, Benjamin F.	Wallingford,	"	1856
Hillyer, H. V. C.	Branford,		
Hubbard, Stephen G.	New Haven,	Dartmouth,	1843
Ives, Charles L.	"	Jefferson,	1854
Ives, Levi	New Haven,	Yale,	1838

NEW HAVEN COUNTY—*continued.*

Names.	Residence.	Name of College where Graduated.	Date of Diploma or License.
Trot, Robert S.	New Haven.	Coll. P. & S., N. Y.	1844
Johnson, S. C.	Seymour.	Chas. Med. Soc.	license, 1835
Kendall, Julius,	"		
Lindsley, Charles A.	New Haven.	Yale,	1837
Matthews, H. W. S.	"	"	1850
McNeil, Rollin	"	"	1862
Moore, John D.	Naugatuck,	"	1834
Nicoll, John	New Haven.	"	1834
North, Alfred	Waterbury,		
Park, Edwin A.	New Haven,	"	1840
Peck, Orlin W.	"	"	1837
Perkins, George F.	Waterbury,	"	1843
Pierpont, Henry	New Haven.	"	1854
Pinney, Charles H.	Derby,	Coll. P. & S., N. Y.	1853
Platt, Gideon L.	Waterbury,	Yale,	1835
Reynolds, D. F.	Guilford,		
Ruckdeschl, A.	New Haven,	Germany,	
Sanford, Leonard J.	"	Jeff. Med. Coll.	1854
Shelley, Charles W.	Ansonia,	Yale,	1852
Smith, Ira	New Haven.	Harvard.	1847
Smith, Justus	North Guilford,		
Stillman, B. F.	North Haven,		
Stockmann, C. Oswald	New Haven,	Germany,	
Stoddard, Thomas	Seymour.	Yale,	1836
Swift, E. D.	Hamden,		
Sumner, George D.	New Haven,	Ct. Med. Soc. 1824,	Honorary, 1840
Talcott, Alvan	Guilford.	Yale,	1831
Thomson, Charles S.	Fair Haven,	"	1852
Thomson, William H.	"	"	1862
Tuller, Thomas H.	New Haven,	"	1837
Townsend, T. R.	"	"	1850
Treadwell, Oliver F.	"	"	1863
Tuttle, Frank B.	Naugatuck,	"	1863
Tyler, David A.	New Haven.	"	1844
Washburn, Edward L.	"	"	1860
White, Moses C.	"	"	1864
White, Wm. H.	Fair Haven.		
Whittemore, F. J.	New Haven.	N. Y. Univ.	1851
Webb, D. M.	Madison.	Yale,	1841
Winchell, A. E.	New Haven,	Coll. P. & S., N. Y.	1865
Wixon, Hanford L.	"	Yale,	1860

HARTFORD COUNTY.

Allen, Francis P.	North Granby,	Yale,	1835
Babcock, E. D.	New Britain,	Geneva,	1841
Barrows, A. W.	Hartford	Yale,	1841
Beresford, Samuel H.	"	R. C. S. Edin.	1826
		M. D., Univ. Edin.	1828
		R. C. S. Lond.	1826
Bruce, Edward	West Hartford.	Castleton, Vt.	1829
Brandegee, E.	Berlin,	Yale,	1838
Bromley, Daniel T.	Hartford,	"	1862
Brown, Chauncey	Farmington,	Bowdoin,	1822
Brownell, Edmund R.	E. Hartford.	Berkshire.	1842

HARTFORD COUNTY—*continued.*

Names.	Residence.	Name of College where Graduated.	Date of Diploma or License.
Brownell, William R.	Hartford,	N. Y. Univ.	1852
Bunce, H. C.	Glastenbury,	Yale,	1850
Burnap, S. R.	Windsor Locks,	Coll. P. & S., N. Y.	1862
Butler, John S.	Hartford	Jeff. Med. Coll.	1859
Brinsmade, Noah H.	Southington,	Yale,	1834
Carrington, Charles	Farmington,	Coll. P. & S., N. Y.	1860
Camp, J. W.	Bristol,	Yale,	1835
Case, James	Granby,	"	1824
Childs, Henry E.	E. Hartford,	Harvard,	1863
Childs, Seth L.	"	Woodstock, Vt.	1835
Collins, William D.	Hartford,	Harvard,	1864
Clary, George	New Britain,	Yale,	1847
Comings, H. N.	"	Castleton, Vt.	1845
Cooke, E. F.	Wethersfield,	Yale,	1838
Crary, David	Hartford,	Castleton, Vt.	1834
Crary, David, Jr.	"	Yale,	1869
Dana, G. P.	"	Coll. P. & S., N. Y.	1859
Denison, Charles	"	Vermont Univ.	1857
Dewey, James B.		Harvard,	1861
Dimmock, Daniel W.	West Suffield,	Dartmouth,	1866
Dudley, Edward M.	Hartford,	Harvard,	1858
Easton, Martin W.	"	Coll. P. & S., N. Y.	1867
Edwards, George W.	North Granby,	Yale,	1862
Ellsworth, P. W.	Hartford,	Coll. P. & S., N. Y.	1855
Elton, William	Burlington,	Berkshire,	1854
Fisk, Marcus L.	Waterloom Polsh.	Penn. Univ.	1842
Fuller, Horace S.	Hartford,	Coll. P. & S., N. Y.	1865
Fox, Roswell	Wethersfield,	N. Y. Univ.	1844
Gray, Henry	Bloomfield,	Dartmouth,	1847
Griswold, Rufus W.	Rocky Hill,	Coll. P. & S., N. Y.	1854
Hamlin, C.	E. Granby,	Yale,	1823
Hart, Charles E.	N. Britain,	Coll. P. & S., N. Y.	1859
Hart, Frederick A.	Southington,	Yale,	1858
Hart, S. W.	New Britain,	"	1855
Hastings, T. M.	Hartford,	Coll. P. & S., N. Y.	1862
Hawley, George B.	"	Yale,	1836
Hawley, George F.	"	Coll. P. & S., N. Y.	1867
Higgins, Gordon A. J.	Plymouth,	Bellevue Hosp. Coll	1869
Hubbard, G. A.	South Glast'bury,		
Hudson, William M.	Hartford,	Jeff. Med. Coll.	1855
Hunt, E. K.	"	" "	1859
Hurlbut, George A.	Glastenbury,	Coll. P. & S., N. Y.	1863
Jackson, J. C.	Hartford,	Jeff. Med. Coll.	1843
Jarvis, George C.	"	N. Y. Univ.	1861
Leonard, E. E.	Broad Brook,	Conn. Med. Soc'y,	License, 1868
Lewis, George F.	Collinsville,	Yale,	1865
Lewis, John B.	Hartford,	N. Y. Univ.	1853
Lyon, Edward E.	New Britain,	Berkshire,	1862
Lyon, Irving W.	Hartford,	Coll. P. & S., N. Y.	1863
Mann, Jarvis K.	Suffield,	Harvard,	1851
Marsh, Nathan	Hartford,	Castle. Med. Coll.	1857
Mehlenbeck, L. W.	East Hartford		
Moody, George A.	Unionville,	Yale,	1844
Mott, Thomas	Hartford,	Brown Univ.	1824
Morrison, Albert	Windsor,	Coll. P. & S., N. Y.	1867
O'Flaherty, John	Hartford,	Albany,	1864
Pelt, Daniel	"	Yale,	1809
Parsons, E. F.	Thompsonville,	Coll. P. & S., N. Y.	1859

HARTFORD COUNTY—*continued.*

Names.	Residence.	Name of College where Graduated.	Date of Diploma or License.
Pease, Levi S.	Thompsonville,	Penn. Univ.	1845
Prentice, S. C.	Hartford,	Berkshire,	1844
Palma de Yligo de Cortez, C. A.	"	Univ., S. Salvador,	1848
Rockwell, S. W.	E. Windsor Hill,	Ct. Med. Soc. 1844.	Honorary. 1855
Risley, A.	Suffield,	Berkshire,	1826
Rising, H. M.	S. Glastenbury,	Yale,	1859
Russell, Gordon W.	Hartford,	"	1837
Sanford, George W.	Tariffville,	Berkshire,	1836
Scott, William	S. Manchester,	"	1831
Shepherd, Geo. B.	Collinsville,	Yale,	1860
Stearns, Henry Putnam	Hartford,	Yale,	1855
Stevens, George B.	"	"	1859
Strickland, S. L.	Enfield,	Albany,	1839
Stone, J. S.	New Britain,	Coll. P. & S., N. Y.	1865
Storrs, Melancthon	Hartford,	Yale,	1854
Tiffany, R. W.	Collinsville,	Castleton, Vt.	1837
Treadwell, W. H.	Hartford,	Berkshire,	1858
Wainwright, W. A. M.	"	Coll. P. & S., N. Y.	1861
Warner, Abner S.	Wethersfield,	Dartmouth,	1847
Way, H. E.	Bristol,	N. Y. Univ.	1849
Wells, Gaylord	West Hartford,	"	License, 1837
Wheeler, Frank	Farmington,	Coll. P. & S., N. Y.	1863
White, R. A.	Simsbury,	Yale,	1832
Wilcox, Lucius S.	Hartford,	Coll. P. & S., N. Y.	1855
Wilson, S. A.	Windsor,	Yale,	1852
Wood, William	E. Windsor Hill,	N. Y. Univ.	1847

NEW LONDON COUNTY.

Abbott, F. S.	Norwich,	Berkshire,	1865
Allen, F. B.	"	Yale,	1859
Bichard, William M.	Uncasville,	Georgetown, D. C.	1866
Bolles, J. C.	Montville,	Castleton,	1860
Brainar, F. S.	New London,	Bellevue,	1866
Brewer, M. K.	Lyman,	Berkshire,	1843
Carleton, Chas. M.	Norwich,	Harvard,	1851
Cassidy, Patrick	"		
Chapman, A. T.	Mystic,	Coll. P. & S., N. Y.	1843
Coates, A. W.	Mystic River,	Yale,	1843
Coates, E. P.	Mystic Bridge,	"	1861
Comwell, H. S.	New London,	"	1861
Chase, Seth L.	Colchester,	Coll. P. & S., N. Y.	1860
Dyer, Elijah	Norwich,	Berkshire,	1838
Fatesworth, R.	"		
Francis, D. P.	New London,	Berkshire,	1845
Fuller, A. B. F.	Norwich,	Castleton,	1853
Graves, T. T.	"	Harvard,	1811
Gray, Alvah	N. Stonington,	Yale,	1863
Gray, John	Mystic River,	Yale,	1865
Green, R.	Lebanon,		
Griffin, E. D.	Old Lyme,	Coll. P. & S., N. Y.	1865
Gulliver, D. F.	Norwich,	Jefferson,	1852
Hale, A. B.	"	Yale,	1843
Harris, G. W.	Old Lyme,		
Roberts, Albert	New London,	Univ. Penn.	1858

NEW LONDON COUNTY—*continued.*

Names.	Residence.	Name of College where Graduated.	Date of Diploma or License.
Hyde, William	Stonington.	Harvard,	1830
Johnson, Samuel	Bozrah,	Yale,	1829
Kinney, E. C.	Norwich.		
Kinney, Lot W.	No Stonington.	Castleton,	1852
Manning, Mason	Mystic,	Yale,	1818
Manwaring, R. A.	New London,	"	1833
Maynard, S. R.	Norwich,	"	1842
Martin, J. W.	"		
Miner, O. E.	Noank,	Univ., N. Y.	1851
Morgan, Frederick	Colchester,	Yale,	1819
Nelson, A. W.	New London,	Harvard,	1841
Noyes, R.	Old Lyme,		
Osgood, Charles	Norwich,		
Paddock, Lewis S.	"	Univ., N. Y.	1854
Parsons, E. W.	Colchester,		
Perkins, P. A.	East Lyme,		
Perkins, W. S. C.	Norwich,	Coll. P. & S., N. Y.	1860
Phinney, E.	"	Yale,	1835
Porter, Isaac G.	New London.	Univ. Penn	1830
Potter, Henry	"	Yale,	1803
Routh, H. F.	Norwich,	Castleton,	1854
Soule, William	Griswold,	Yale,	1851
Stanton, George D.	Stonington,	Bellevue,	1865
Tillinghast, F. A.	Ragleville,	Castleton,	1867
Tracy, L. A.			
Warren, Levi	Norwich,	Univ., N. Y.	1854
Weaver, James L.	Preston,	Yale,	1860
Witter, William	Greeneville,	"	1865
Woodward, Ashbel	Franklin,	Bowdoin,	1829

FAIRFIELD COUNTY.

Abernethy, Augustus H.	Bridgeport,	Yale,	1864
Baldwin, James	Danbury,		
Barber, A. D.	Bethel,		
Barlow, James E.	Norwalk,	Coll. P. & S., N. Y.	1865
Beardsley, Edward M.	Monroe,		
Beers, George L.	Bridgeport,	Coll. P. & S. N. Y.	1865
Bennett, E. T.	Danbury,	Berkshire,	1826
Bennett, W. C.	"	Coll. P. & S., N. Y.	1860
Birch, George W.	No. Stamford.	Yale,	1862
Blackman, George	Westport.	L. Ch. M. Soc. 1837.	Yale Hon. 1865
Boston, George S.	"	Yale,	8156
Brewer, James D.	Bridgeport.	Edinburgh Univ.	1832
Brownson, William G.	New Canaan,	Coll. P. & S., N. Y.	1863
Bassett, H. L. W.	Bridgeport,	Yale,	1844
Cumming, James R.	"	Coll. P. & S., N. Y.	1862
Dunham, Martin V. B.	Greenfield.	Harvard.	1867
Dyer, George	Trumbull,	Yale.	1838
Emery, A. E.	White,	Burlington, Vt.	1865
Gray, R. M.	Stratford,		
Gregory, Elijah	Bridgeport,	Yale,	1856
Gregory, Ira	Norwalk,	"	1829
Gregory, James G.	"	Coll. P. & S. N. Y.	1858
Haight, N. D.	Stamford.	Yale,	Honorary. 1871

FAIRFIELD COUNTY—*continued.*

Name	Residence.	Name of College where Graduated	Date of Diploma or License
Hickok, O. S.	Ridgefield,		
Higgins, H. L.	So. Norwalk,	Bellevue,	1853
Hill, John	"	Univ., N. Y.	1843
Hill, Seth	Stepney Depot,	Yale,	1805
Hoyt, James H.	Stamford,		
Hubbard, Robert	Bridgeport,	Yale,	1851
Lauder, Robert	"	"	1871
Lewis, George P.	"	"	1858
Lockwood, W. A.	Norwalk,	Coll. P. & S., N. Y.	1864
Lyons, Samuel	"	" "	1846
McLean, J. W.	Norwalk,		
Munson, Byron W.	Easton,	Yale,	1869
Nash, David H.	Bridgeport,	"	1854
Nash, William B.	"	Omio. Med. Soc'y.	Diploma, 1850
Noyes, Samuel S.	New Canaan,	Yale,	Honorary, 1843
Obermeyr, Gustave	Bridgeport,	Univ. Berlin,	1862
Purdee, Moses B.	So. Norwalk,	Albany,	1855
Potter, George L.	Bridgeport,	Jeff. Med. Coll.	1852
Richards, Lewis	New Canaan,	Coll. P. & S., N. Y.	
Roberts, C. S.	Westport,	" "	1864
Sands, Samuel	Darien,	Westchester Co., N. Y.	M.Soc.S. 1849
Sheldon, Gould A.	Bloomington,	Yale,	1869
Sherwood, Justus	Southport,	"	1827
Smith, Andrew J.	Bridgeport,	Coll. P. & S., N. Y.	1863
Stackweather, E. P.	Nichols' Farms,	Berkshire,	1849
Todd, William S.	Ridgefield,	Coll. P. & S., N. Y.	1867
Trowbridge, W. H.	No. Stamford,		
Wakeman, Moses W.	Redding,	Yale,	1854
Williams, A. L.	Brookfield,		
Winslow, E. H.	Southport,	Univ., N. Y.	1858
Wood, Luther H.	Monroe,	Yale,	1860

LITCHFIELD COUNTY.

Bacon, J. Knight,	New Milford,	Yale,	1864
Bassett, E.	Wolcottville,		
Barber, A. E.	"	Berkshire,	1858
Beach, W. J.	Litchfield,	Coll. P. & S., N. Y.	1870
Bidwell, John W.	W. Winsted,	Berkshire,	1846
Elwell, William	Lakeville,		
Hodgett, J. H.	Salisbury,		
Scott, F.	Bethlehem,	Bellevue,	1864
Sherwin, David E.	Litchfield,	Albany,	1846
Browne, O.	Washington,		
Seel, Henry W.	Litchfield,	Coll. P. & S., N. Y.	1845
Hall, C. W.	Terryville,	Yale,	1867
Camp, D. B. W.	Northfield,		
Deming, Ralph	Norfolk,	Yale,	Honorary, 1857
Deming, William	Morris,	Berkshire,	1866
Dutcheon, John B.	Warren,	Jefferson, Phil.	1856
Dawson, M.	Roxbury,		
Ensign, H. E.	Harwinton,		
Forster, R. M.	Washington,	Yale,	1849
Gates, H. E.	Litchfield,	L. I. Hosp. Coll.	1863

LITCHFIELD COUNTY—*continued.*

Names.	Residence.	Name of College whose Graduated.	Date of Diploma or License.
Gillette,	Falls Village,		
Goodwin, Ralph S.	Thomaston,	Coll. P. & S. N. Y.	1866
Hinsdell, T. S.	Wolcottville,		
Knight, H. M.	Lakeville,	Berkshire,	1843
Knight, W. W.	Sharon,	"	1836
Lyman, A. H.	New Preston,		
Lyman, E. P.	"		
Mallie, C. B.	Falls Village,		
Miner, G. H.	Morris,	Yale,	1834
Munger, W. S.	Watertown,	"	1855
North, Erwin S.	Cornwall,		
Orton, J. G.	Lakeville,	Bellevue,	1870
Phelps, J. W.	Wolcottville,		
Porter, William	Litchfield,	Buffalo Univ.	1851
Salisbury, S. T.	Plymouth,		
Sanford, Edward	W. Cornwall,		
Shove, H. W.	Woodbury,	Yale,	1854
St. John, G. H.	Gaylordsville,	" Lic. 1837, Hon.	1840
Wade, C. H.	Woodbury,		
Welch, Benjamin A.	Lakeville,	Yale,	1853
Welch, James	W. Winsted,		
Welch, John H.	Norfolk,	Berkshire,	1849
Welch, William W.	"	Yale,	1850
Woodruff, William	Thomaston,	"	1838
Wright, A. A.	Canaan,		
Young, Francis J.	Riverton,	Yale,	1864

WINDHAM COUNTY.

Aikens, Horace E.	Windham,	Berkshire,	1867
Baldwin, Elijah	Canterbury,	Harvard,	1845
Bennett, Putnam O.	Westford,	Berkshire,	1850
Bradford, Milton	West Woodstock,	Harvard,	1851
Bugbee, LaFayette	Willimantic,	Coll. P. & S. N. Y.	1866
Burgess, Frank S.	Mooreg,	Albany,	1858
Campbell, H.	Valley Falls,		
Capron, William H.	Plainfield,	Yale,	1853
Carr, Allen E.	Moosup,	Harvard,	1869
Hall, Edwin A.	E. Killingly,	Harvard,	1858
Hills, T. Morton	Willimantic,	Yale,	1863
Holbrook, Lowell	Thompson,	N. Y. Univ.	1841
Hosford, Charles	"	"	1853
Hough, Henry W.	Putnam,	Yale,	826
Hovey, Daniel A.	S. Killingly,	L., O. M. Soc. 1830. Yale Hon.	1847
Hughes, D.	Hampton,		
Huntington, Elizabeth	Windham,	Dartmouth,	1847
Hutchens, S.	West Killingly,		
Kent, J. D.	Putnam,		
Leonard, A. S.	S. Windsor,	Coll. P. & S. N. Y.	1866
Lewis, William A.	Mooney,	Harvard,	1847
Marcy, Lorenzo	Woodstock,	Licensed 1818. Yale Hon.	1833
Pingree, D. E.	Putnam,	L. Mass. Soc. 1846. N. Y. M. C. Hon.	1850
Rogers, Charles H.	Central Village,	Yale,	1847
Rogers, Frederick	Willimantic,	N. Y. Univ.	1863
Simmons, John H.	Ashford,	Yale,	1833
Whitcomb, James B.	Brooklyn,	Bowdoin,	1826
Williams, Lewis	Pomfret,	Harvard,	1842

WINDHAM COUNTY—*continued.*

Names	Residence.	Name of College where Graduated	Date of Diploma or License
Witter, John	E. Woodstock,	Yale,	1823
Witter, Orrin	Chaplin,	"	Honorary, 1843
Woodbridge, William	Brooklyn,	"	1844

MIDDLESEX COUNTY.

Alsop, J. W., Jr.	Middletown,		
Baker, Rufus	"		
Bidwell, Edwin	Deep River,	Yale,	1841
Blake, J. E.	Middletown,		
Burke, George W.	"		1843
Cleaveland, P. A.	"		
Cressy, Noah	"	Berkshire,	1862
Edgerton, Francis D.	"	Univ. Vt. 1863. C. P. & S., N. Y.	1864
Granniss, John H.	Old Saybrook,	Yale,	1860
Hallock, Winthrop B.	Middletown,	L. I. Hosp. Coll.	1864
Hammond, C. E.	Portland.		
Haven, Miner C.	Haddam,	Univ. Mich.	1854
Hough, Alanson H.	Essex,	Yale,	1832
Hutchinson, Ira	Cromwell,	"	1825
Hubbard, Charles H.	Essex.	"	1858
Hubbard, Denison H.	Clinton,	"	1859
Jarvis, George O.	Portland.	L. Ct. M. Soc. 1811,	Yale Hon. 1846
Lawry, D. F.	East Hampton.		
Mathewson, Rufus W.	Durham,	Col. P. & S., N. Y.	1857
Morgan, J.	Middletown,	Yale,	1865
Noyes, Sheldon W.	"	Univ. Penn.	1865
Nye, Elisha B.	"	Yale,	1859
Seare, C. A.	Portland,	Univ. N. Y.	1867
Shaw, Abram M.	Middletown,	Jeff. Med. Coll.	1859
Turney, Sylvester W.	Chester,	Yale,	1842
Worthington, Albert E.	Middle Haddam.	"	1842

TOLLAND COUNTY.

Bennett, M. B.	Coventry,	Berkshire,	1863
Hodgett, Joshua	West Stafford.	"	1825
Brigham, Norman	Mansfield Depot,	Conn. Med. Soc.	License, 1812
Brown, W. L. M.	Hebron,		
Clark, William N.	Stafford,		
Dean, Henry S.	S. Coventry,	Jefferson Med. Coll.	1852
Dibbinson, F. L.	Rockville,	Yale,	1860
Dimock, Timothy	S. Coventry,	"	1823
Goodrich, A. B.	Vernon Depot,	Berkshire,	1845
Griggs, O. B.	Mansfield Center,	Univ. N. Y.	1847
Hall, N. G.	Rockville,	Yale,	1860
Isham, Oliver K.	Tolland,	"	1822
Newton, C. B.	Stafford Springs,	"	1851
Parker, Julius N.	Mansfield Depot,	"	1862
Preston, G. H.	Tolland,	Castleton, Vt.	1844
Richardson, William H.	Mansfield,	Yale,	1834
Risley, S. G.	Rockville,	Univ. N. Y.	1846
Sumner, C. F.	Bolton,	Col. P. & S. Western, N. Y.	1846
Warren, J. A.	Ellington,		
Wood, Orrin	Somers,	Yale,	Honorary, 1849

APPENDIX C.

AN ACT TO PROMOTE MEDICAL SCIENCE.

PASSED AT THE MAY SESSION, A. D. 1871.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

SEC. 1. It shall be lawful for the first selectman of any town having a population exceeding twenty thousand persons, and for the mayor of any city having like population, to deliver to the professors and teachers in chartered medical colleges in this State, and for such professors and teachers to receive the body of any deceased person in such town or city, for the purposes of medical and surgical study: *provided*, that said body shall not have been buried, and shall not have been claimed for burial by any relative or friend within twenty-four hours after death; *and provided also*, that the body of no person who may be known to have relatives or friends, shall be so delivered or received without the consent of such relatives or friends; *and provided also*, that the body of no person detained on any civil process, or for trial on a charge of any criminal offence, nor of any traveler or stranger, nor of any person who shall be known at any time to have expressed a desire that his or her body should be buried, shall be delivered or received as aforesaid; *and provided also*, that in case the remains or body of any person so delivered or received shall be subsequently claimed by any surviving relative or friend for burial, they shall be given up to such relative or friend for that purpose. And it shall be the duty of said professors and teachers decently to bury in some public cemetery, the remains of all bodies after the same shall have answered the purposes of study aforesaid. And it shall be the duty of every medical college receiving such bodies, to keep a record of the names, sex, and last residence of every person so received and the place where the remains of such person, or persons, are interred.

SEC. 2. The remains or bodies of such persons as may be received by the professors and teachers aforesaid, shall be used for the purposes of medical and surgical study alone, in a manner consistent with public propriety, and in this State only; and no person shall use such remains for any other purpose, nor in any manner traffic in, nor remove, nor cause, nor permit such body or remains to be removed beyond the limits of this State.

SEC. 3. Every person who shall knowingly and willfully violate any of the provisions of this act, and every person who shall deliver or receive any such body or remains for purposes of speculation or pecuniary profit shall, on conviction thereof, be punished by a fine not less than one hundred dollars and not exceeding one thousand dollars, and by imprisonment in a common jail not more than one year.

SEC. 4. All laws inconsistent herewith are hereby repealed; but nothing herein contained shall be so construed as to affect or repeal any laws now in force providing for the protection of burying grounds or places of sepulture.

Approved by the Governor, July 27th, 1871.

EDITORIAL NOTICES.

In presenting to the Society the Proceedings for this year, the Publishing Committee desire to say that no one can regret more than themselves the unusual delay in the publication. Important papers withheld from the committee rendered it impossible even to commence printing until after the middle of July. A further delay was allowed until the early part of September with the expectation of receiving other papers asked for by the Society; and on final failure to receive them, the Committee decided to proceed with the publication of such papers on hand at that time as would be most acceptable to the Society.

The Committee appointed to present a revised list of Fellows and Officers of the Society from its first organization to the present time have made no report to the Committee of Publication.

It is believed that the labors of the Committee on Registration of Regular Practitioners in the State, will be duly appreciated. The alphabetical list prepared by that Committee has been revised and about fifty names added since the report was presented to the Society.

It is earnestly requested that the names of all regular practitioners which do not appear in the list now printed may be presented to the appropriate committee next year, and that physicians who have not furnished the dates of their diplomas and places of graduation will supply those deficiencies and render it possible to prepare a complete list hereafter. Attention is therefore directed to the reasonable request of the Committee as contained in their report (Appendix E).

The entire profession will rejoice that at last the Legislature of this State has passed an Act to Promote Medical Science (see Appendix C).

With a feeling of sadness we present a long list (see Obituary Tablets) of brave and good men who have fallen from our ranks the past year, and do what we can to perpetuate their memory as they are enthroned in the hearts of co-laborers in the noble work of alleviating human suffering.

In conclusion, the Committee would express the hope, that hereafter every physician who prepares a paper which he thinks worthy of the attention of the State Society, will have it READY FOR THE PRINTER before the meeting of the *Annual Convention*.

The Proceedings are sent by mail to all members of the Society not in arrears for taxes, to all Honorary Members and to Delegates from other Societies, to the Secretaries of other State Societies, and to Editors of Medical Journals who desire them.

Persons entitled to the Proceedings who fail to receive them are requested to send their names and Post Office address to the Secretary.

In behalf of Committee of Publication,

M. C. WHITE,

Secretary of the Conn. Med. Society.

113 George Street, New Haven, Conn.